



University of Palestine

Faculty of Information Technology

Department of Management

Information Systems

Ekhtaberni

Web application for
E-learning and E-exams
system

Submitted by

Mohanned Khader Afana

Hazem Zafer Al-Nakhal

Mohammed Al-Najjar

Supervised by

Eng. Eman Al-Ajrami

DEDICATION

TO...

OUR PARENTS

OUR BROTHERS AND SISTERS

OUR TEACHERS

OUR FRIENDS

WITH ALL LOVE AND GRATITUDE

WE DEDICATE THIS WORK

ABSTRACT

In recent years, with the development technologies, people became more and more depending on the internet and technologies in their life. In the same time, the education field getting more and more bigger.

Ekhtaberni is a web application that allow teachers to make exams online and allow students to solve it online. This project developed to make it easier for teachers to make an exam and more accurate to correct the answers and calculate grades and average.

Waterfall modified SDLC methodology have been followed to develop the system, it have been passed through five stages starting from requirements analysis and ended with Integration and maintenance.

The requirements of the system have been determined through interviews and two types of questioner, one for teachers and the other is for students. The final result is that most of participants agreed that using Ekhtaberni is more effective , efficient, and easier for teachers, students, and managers. In addition, most of them founded the system is easy to use and achieve usability and learnability after trying the system and deal with it.

According to the survey and the evaluation of the system, it can be estimated that the idea of Electronic Exams System is applicable and can be implemented in the schools.

List of contents

INTRODUCTION.....	1
1.1 Background	2
1.2 Motivation of the research.....	3
1.3 Problem Statement	3
1.4 Research objectives	3
1.5 Significance of the research	4
1.6 Scope and limitations	4
LITERATURE REVIEW	5
2.1 Traditional education.....	6
2.2 School tests.....	6
2.3 Electronic learning (E-learning).....	7
2.4 The benefits of E-learning.....	7
2.5 Related work	8
2.5.1 Moodle.....	8
2.5.2 Mdrasati site (students gate)	8
METHODOLOGY	10
3.1 Introduction	11
3.2 Design Research Methodology	11
3.3 Tools and techniques	12
3.4 The Waterfall Methodology	13
3.5 Why adopting waterfall is suitable for Ekhtaberni.....	13
3.6 Implementation of Waterfall	13
3. 6.1 Requirements Analysis	14
3. 6.2 Design.....	14

3. 6.3 Implementation	15
3. 6.4 Testing and installation.....	15
3. 6.5 Maintenance.....	15
REQUIREMENT ANALYSIS.....	16
4.1 Introduction	17
4.2 System Description	17
4.3 Users Description	17
4.3.4 Student	17
4.3.2 Manager	17
4.3.3 Teacher	18
4.3.4 Secretary	18
4.4 System Requirements.....	19
4.4.1 Functional requirements	19
4.4.2 Non-Functional Requirements.....	21
4.5 System Analysis	24
4.5.1 Use case diagram	24
4.5.2 Activity diagram	26
4.5.3 Sequence Diagram.....	27
DESIGNING AND IMPLEMENTATION.....	29
5.1 Design phase	30
5.1.1 Class diagram	30
5.1.2 Database Schema	32
5.1.3 Entity Relationship (ER) Diagram	33
5.2 Implementation Phase	35
5.2.1 User Interfaces.....	36
TESTING AND IMPLEMENTATION.....	38
6.1 Testing.....	39

6.1.1 Performance Testing.....	39
6.1.2 Functionality testing	41
6.2 Evaluation.....	41
6.2.1 Usability evaluation.....	41
6.2.2 End User Evaluation.....	42
CONCLUSION AND FUTURE WORK	50
7.1 Conclusion.....	51
7.2 Future Work	51
References.....	53

List of figures

Figure 1 Waterfall Methodology	11
Figure 2 Waterfall Steps	14
Figure3 Users of the system.....خطأ! الإشارة المرجعية غير معروفة.	
Figure 4 System use case diagram	25
Figure 5 delete user activity diagram.....	26
Figure 6 view student details activity diagramخطأ! الإشارة المرجعية غير معروفة.	
Figure 7 Add user sequence diagram.....	28
Figure 8 Class diagram	31
Figure 9 Database Schema.....	32
Figure 10 Entity Relationship (ER) Diagram	34
Figure 11 Implementation of the web system.....	35
Figure 12 Admin control panel	36
Figure 13 Teacher control panel	37
Figure 14 Student control panel.....خطأ! الإشارة المرجعية غير معروفة.	
Figure 15 Exams view	60
Figure 16 Ekhtaberni home page slider	خطأ! الإشارة المرجعية غير معروفة.
Figure 17 Section of the system.....	60
Figure 18 Managing students page	61
Figure 19 Add new student	61
Figure 20 Managin exams page	62
Figure 21 Add new question page	62
Figure 22 Managing teachers page	63
Figure 23 Add new teacher page	63
Figure 24 Managing administrations page.....	64
Figure 25 Add new admin page	64
Figure 26 Home page on mobile.....خطأ! الإشارة المرجعية غير معروفة.	
Figure 27 Main sections on mobile.....	65
Figure 28 Login page on mobile.....	66
Figure 29 Add student page on mobile	67
Figure 30 Using YSLOW tool	40
Figure 31 Number of participants	42

Figure 32 Gender percentage	43
Figure 33 Age percentage	43
Figure 34 Qualification	44
Figure 35 Experience of using the web.....	44
Figure 36 End-users' perceptions about the usability of the system (1).....	45
Figure 37 End-users' perceptions about the importance of the system (2).....	46
Figure 38 End-users' perceptions about the ease of use of the system (1)	46
Figure 39 End-users' perceptions about the ease of use of the system (2)	47
Figure 40 End-users' perceptions about the learnability of the system	48
Figure 41 End-users' perceptions about output and future work of the system (1).....	48
Figure 42 End-users' perceptions about output and future work of the system (2).....	49

List of tables

Table 1 List of Appreviations	IX
Table 2 Tools and techniques	12
Table 3 Tools used for testing the website.....	39

Table 1 List of Appreciations

ER	Entity Relationship
LMS	Learning Management System
E-learning	Electronic Learning
GUI	Graphical User Interface
WWW	World Wide Web
HTML	Hypertext Markup Language
SDLC	System Development Life Cycle
CSS	Cascading Styling Sheets
PHP	Hypertext Preprocessor
HTTP	Hypertext Transfer Protocol
CDN	Content Delivery Network
AJAX	stands for Asynchronous JavaScript and XML
DOM	Document Object Model
URL	Uniform Resource Locator
UML	Unified Modeling Language
SMS	Short Message Service
SQL	Structured Query Language

CHAPTER 1

INTRODUCTION

1.1 Background

This is the age of rapid changes that were the result of the scientific and technologic progress, such as internet and smart phones, as well as the technical information development, this holistic progress amended the necessity to keep track with the new problems that resulted from rapid progression of accompanied educational process.

The huge amount of information, the increasing number of students, contrasted to the few number of teachers, and students' location in far distances to their schools are examples of new emerging problems.

These technological changes have led to the emergence of new techniques and methods in education. in term of education process, self-education was a solutions to keep track with technological progress, which gave the concept of structured education, and the concept of Computer-Aided education, in addition to the concept of distance education and learning ,in which students are positioned anywhere in the world with the privilege of studying without the need for a physically stationed teacher.

Distance education has become a primary topic of interest in the field of educational communications and technology (Lee , 2006).

With the advent of the technological revolution in information technology, which has made the world a small village, it increased the need to exchange experiences with others, and the need for students' environment rich in multi-source research and self-development, emerged the concept of learning and e-learning, which is a teaching methodology that cares about delivering information to the learner, based on modern computer system and through the World Wide Web (www) of information and multimedia such as multiple CD-ROMs, educational software, e-mails, dialogues, discussions and virtual classrooms.

The idea of the project came from the need of merging the technologies and web applications with the education field in order to facilitate education process for teachers and students.

1.2 Motivation of the research:

The motivation of doing the research is to enter the electronic intelligence and web tools to most of life aspects; especially education field, students and teachers should take advantage of technologies in order to serve society and institutions. It is important to keep track with the rapid development, especially in the field of public services to the community through the most accurate and best technological tools. This kind of projects potentiates self-dependent learning, which reinforces active learning and exploration of new programming languages while highlighting capabilities in this field.

1.3 Problem Statement

Traditionally, students solve their exams on paper, this may lead to many problems, for example when the teacher lose student's exam. In addition, a huge increase in numbers of population and the consequent increase in student numbers in each class may affect on the students understanding when they are solving an exam and confuse them. Moreover, students always face a problem with management of allocated time for exams. Finally, the teachers faces a problem correcting the answers that takes time and effort, and sometimes there may be errors in correcting and putting the marks in the teachers books.

1.4 Research Objectives:

The main objective of Ekhtaberni system is to make a website that students can attend their exam through it.

Other objectives of Ekhtaberni are:

1. To save time by offering the test via internet.
2. To enforce rapid thinking and logic solving in students with a timed internet based examination system.
3. To save teacher's and students' data directly to the computerized database.
4. To deploy the technologies that are existent in each home.
5. To save effort of correcting the answers and generating the grades.
6. To encourage the students by moving from paper-based exams to computer-based exams.

1.5 Significance of the research

Time and effort sparing as of correcting the exams and calculating the grades. In addition, the system can save the grades directly and Synchronously to database. And finally, Students can easily access the exams and track their marks.

1.6 Scope and Limitations

1.6.1 Scope

1. The system is targeting students of the primary schools.
2. The system is free for students.
3. The system is focusing on the people in Gaza strip.
4. Website can work on any platform even PCs or mobiles.
5. The duration of the project is 4 months from the start to the end.
6. The system has only one type of questions, which is choose the correct answer.

CHAPTER 2

LITERATURE REVIEW

2.1 Traditional Education:

Traditional education is based on three main points: a teacher, a learner, and information. Traditional education has been found since ancient times and continues to the present. We do not believe that it could be dispensed all together because the merits of this physical system can't be recreated by any other alternative.

One of the most positive aspects of this real-life teaching traditional style is that, teachers get to meet their students face to face directly. As known in the media, this is the most powerful method of communication in between two people.

But at the present time, the traditional education faces some problems such as:

- 1- The huge increase in the numbers of the population and the consequent increase in the numbers of students.
- 2- Lack of qualified teachers supervisors.
- 3- The enormous explosion of knowledge and the consequent complexity of the education.
- 4- The short coming of the individuals differences between students.
- 5- Increased waste of resources, which may reflect negatively on the efficiency of the process.
- 6- The high cost of providing educational services, such as the cost of transporting.
- 7- The inability to achieve customer satisfaction and meet the desires.
- 8- Inability to focus on the quality of the process and outputs.

Teacher binding to terminate a huge amount of information in a specified time, which may not lead some learners to follow-up the exams at the same speed.

With the emergence of such problems, there is a need to use teaching aids to help mitigate their effects.

2.2 School Tests:

School tests takes up the main role as a monitor of achievements in the educational goals, however, curricula have the drop of not particularly specifying what the student should learn and how the process of education is propagated. This has been observed in the recent years, when schools started focusing on tests , as tests provided an indicator to the extent of progress in educational goals

School test is carried out by the teacher for students to transfer them from one level to a higher level. Final tests or exams are almost always linked to frustration and fear of students since old days. Additionally, student's parents were holding an additional way to stress not only to the students, but on themselves as well. The issue with these tests is that they are the sole determinant of students' fate which, de facto, is implicated soon after on the level of social and scientific achievement and status among the society. These defects could be summarized as follows:

- 1- Non-completion of some basic data such as: the name of the student in every paper questions, grade, school year, school name, material, time of testing, grading scale, to identify the type of test (Quiz, midterm exams, final exams, etc.).
- 2- The lack of fullness of the questions, as observed the recurrence of some of the paragraphs of the questions, and focus on topics without the other.
- 3- The presence of teachers while students are in the examination session, make the students ask for explanations for the questions. This act may lead to a focus diaspora of students, where in the meanwhile, they know the answer.
- 4- Lack of precision in the correcting the questions and calculating grades.
- 5- More than a model of questions in one article.
- 6- Some of the students can't attend to the exam for some reasons.
- 7- Leniency in the granting of degrees to students from the Editor.
- 8- A random distribution of grades in some models to answer without taking into account the relative weight of the subject.

2.3 Electronic Learning (E-learning)

E-learning is any type of learning that takes place through a computer. E-learning is primarily facilitated through the Internet but can also be accomplished with CD-ROMs and DVDs, streaming audio or video and other media.

2.4 The Benefits of E-Learning

- 1- The possibility of communication between students and teachers.
- 2- The possibility of changing the way of teaching.
- 3- Flexibility represented by the easiness to modify the educational content.
- 4- Change the role of the teacher from prompter to the role of the supervisor and directed.

2.5 Related Work

In this Section, some projects that are related to Ekhtaberni system will be defined, showing the advantages and disadvantages for each of them and summarize the main features in the table.

2.5.1 Moodle

Moodle is an open source Learning Management System (LMS) that universities, colleges, businesses, and even individual instructors use to add web technology to their courses (Jaswinder, 2014).

But in Gaza, you will find that Moodle is not used in any field except universities, for example Upinar Moodle in university of Palestine.

So, this system aims to use E-learning field especially E-exams one in the schools, especially in Gaza city.

There is many advantages of Moodle, like...

1. Lectures can be uploaded by teachers and downloaded by students.
2. There are ads for the students in each subject.
3. Add an image of the profile.
4. Teacher can add a quiz with specific time frame.

2.5.2 Mdrasati site (students gate)

Palestinian site for the Ministry of Education that is under construction and aims to develop the electronic gate for schools. Minister of education considered that this step is the start of using technologies in the process of education in schools (Ministry of Education, 2016).

Also this project aims to provide standardized electronic gate for all schools in Palestine for contacting between the Ministry, schools, teachers, students, and parents.

This project doesn't provide an E-exam system, it depends on traditional exams and correcting answers, but our project and this project both can contain documents, books, and other files that the teacher can upload.

Table 2.1 shows the comparison between Ekhtaberni, Moodle, and Madrasati systems.

Table 2.1 Related Work

Features	Ekhtaberni System	Moodle	Madrasati
The system Gives E-certificate	Available	Not available	Not available
Send SMS for grades and news	Not available	Not available	Available
Automatic confirmation of the grades and save it in database	Available	Available	Available
The system is secure	Available	Available	Available
Available for university's students and schools students	Not Available	Available	Not Available
Attractiveness of platform	Available	Not available	Not available
The system contains more than one language	Not Available	Available	Not Available
The system contains assignments homework	Available	Available	Available
Post News and Events	Not Available	Availabe	Not Available
Send emails	Available	Available	Available
Used for schools	Available	Available	Available
Service support via phone and email	Available	Available	Not Available
There is more than one type of questions that the system support	Not Available	Not Available	Not Available
Restore password	Available	Available	Available

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter will describe the methodology phases (Sommerville, 2007) that we will use to accomplish the project and the phases that this methodology consist, then the reasons of choosing waterfall methodology will be listed, after that; each phase of waterfall methodology will be described.

3.2 Design Research Methodology

To accomplish this project, the waterfall modified SDLC model will be followed which is the most suitable methodology for small to medium system or sub systems, Just like Ekhtaberni. And also it is suitable for Ekhtaberni because the requirements are well-understood.

As shown in Figure 3.1, there are five steps in waterfall methodology, starts with Requirement analyses, and finishes with Testing and Maintenance.

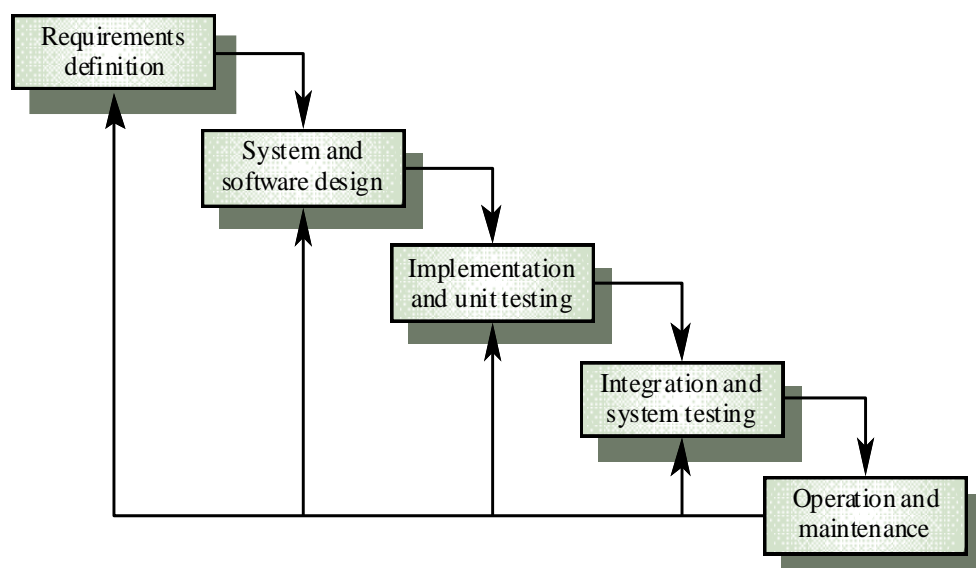


Figure 1 Waterfall Methodology

3.3 Tools and Techniques

There are many activities that have been performed during developing the system. Also, there are some tools, activities, programs, and techniques that have been used to develop the web system, Table 3.1 shows those techniques and tools.

Table 2 Tools and techniques

Phase	Activity	Sub-activity	Software
Requirements Analysis	Define users Requirements	E survey	SPSS
		Interviews	
	Analyze users requirements	use-case diagram	Edraw max 7.0
		sequence diagram	Edraw max 7.0
		activity diagram	Edraw max 7.0
Design and Implementation and integration	Create the database	Draw Schema	Edraw max 7.0
		Develop ER Diagram	Edraw max 7.0
		Code the data base	MySQL Server PHP myAdmin
	Develop the website	Design website structure using HTML 5	PHP storm Notepad++
		Design the website	PHP storm
		Design user interfaces and dynamic website using Java Script and JQuery	PHP storm
		Manage dynamic contents, databases and session tracking using PHP 7	Brackets xampp
Testing and Evaluation	Testing the website	Validate the HTML file	YSlow tool
	Evaluation of the website	Questionnaire	Microsoft office 2013 SPSS

3.4 The Waterfall Methodology

The waterfall methodology founded in 1970 by Dr. Winston Royce who is developed that methodology to help on software development process (Charvat, 2003).

It worked well at that time, and it has many changes and revisions. From 1974 to 1976, Dr. Barry Boehm has developed the Waterfall model into other phases to enhance development projects using this methodology.

Waterfall now is the most widely used methodology, it gets its name from the analogy of water falling downward.

The waterfall model was difficult to use because it is incomplete in its original framework and structure. Now, the most commonly used version available includes a corrective feedback mechanism (Charvat, 2003), see Figure 3.1.

3.5 Why adopting waterfall is suitable for Ekhtaberni?

This methodology has been chosen because:

- 1- It is the easiest and most effective method that could be used.
- 2- Can be developed step by step.
- 3- Understand the requirements of the system significantly.
- 4- It's suitable for small systems.

3.6 Implementation of Waterfall

The five steps of waterfall will be implemented to accomplish this project, each step has its own functions, for example; in requirement gathering and analysis step, the requirements gathered from interviewing, observation, and search. Also System design is divided to logical design like use cases and sequence diagrams, and interface design. See Fig 3.2.

1. Requirements gathering
1.1 interview
1.2 observation
1.3 record searching
2. UML Analysis Design
2.1 logical design
3. Implementation and coding
3.1 interface design
3.2 processing design
3.2.1 database design
4 Testing and Evaluation
5. Feedback and Maintenance

Figure 2 Waterfall Steps

3. 6.1 Requirements Analysis

First, the requirements of the project will be collected and determined, such as the functions of the examination system and the targeted population of the system, whereas those requirements will be determined according to the questioner that will be analyzed using SPSS and Microsoft excel.

The aim of this stage is to collect and clarify the suitable requirements for the proposed system through gathering data from questioner.

3. 6.2 Design

This is the second stage that will focus on developing the design of the system based on the first stage, analyzed requirements' specifications and modeling of the system.

The purpose of this stage is to build the architectural design, Entity Relationship (ER) diagram and Graphical User Interface (GUI) through supporting programs like Photoshop and EdrawMax.

The output of this stage would be a representational prototype of educational system which relies on the previously determined requirements through stage 1.

3. 6.3 Implementation

At this stage, the actual software will be developed according to the proposed design of the system using PHP programming language, in addition to, supportive programming tools such as PHP storm and XAMPP. Thus, it includes software components coding and integration.

The result of this stage will evolve a functionally effective system which shall be ready for testing and debugging.

3. 6.4 Testing and Installation

The developed system will be evaluated, tested using YSLOW tool and questioner, and debugged thoroughly. The goal of this stage is to ensure that the developed system is free of errors, as well as; that it satisfies the users' requirements. At this point, the final functionally effective system will be ready for installation and, thus could be freely used by various end users.

3. 6.5 Maintenance

This is the final stage that will follow the maintenance of the system soon after its installation via feedback circle. At this stage, maintaining, enhancing and updating the system will take place, which involve all the errors that are met through the usage of the developed system which will result in an updated and enhanced system.

CHAPTER 4

SYSTEM REQUIREMENTS AND ANALYSIS

4.1 Introduction

Full description of system and users will be provided in this chapter. Also, functional and non-functional requirements that have been collected through interviewing users, seeing other related systems, and knowing user's needs.

After determining the requirements, it will be analyzed using several methods such as use case diagrams, sequence diagrams, and activity diagrams.

4.2 System Description

Ekhtaberni is a web system that facilitate education process through giving assignments, exams, homework, and quizzes electronically through the website.

This website have too many functions, the admin can add users, delete users and edit information, and also the teacher can post an exam or assignment and the system can correct the answers of the grades and give them their mark in the same time.

Ekhtaberni can also provide additional services such as containing attendance schedule that recorded by the teacher that contain days that student attend to the school, also the admin and secretary can see the user's login history.

In addition, the certificate that is prepared by the system shows the total grade and all grades and the signature of the manager.

4.3 Users Description

There are four main users of the system, each one of them has permissions and each on has his own functions, see Figure 4.1, these four users include:

4.3.4 Student

Student are the main user of the system, they can login to the system and interact with it, and also he can see his or her grades, assignments, advertisements.

Also students can view and print certificate, in addition; students can upload and download files from-to the system.

4.3.2 Manager

Manager (Admin) have full authority and all permissions of the system, he can do all the system functionalities and add users to the system, upload files.

In addition, manager can upload files, add advertisement, and he also can view students and their grades.

4.3.3 Teacher

Teacher is also an essential user of the system, he have many permissions and authority only on the students that he teach.

He can view his students and their grades, add exams, assignments, homework, and form to upload files. He also can add advertisement and send messages to his students.

4.3.4 Secretary

Secretary also have most of permissions just like the manager or admin of the system, He can view his students and their grades, add exams, assignments, homework, and form to upload files. He also can add advertisement and send messages to his students.

Table3 System features for each user

Student	Manager	Teacher	Secretary
<ul style="list-style-type: none">• sign in• attend to exams• view grades• print certificate• solve assignments• upload files• change password• Log out	<ul style="list-style-type: none">• Add secretary• delete user• view teacher details• view student details• add advertisement• print certificate	<ul style="list-style-type: none">• view grades• Add exam• Add assignment• upload file• add advertising• view students	<ul style="list-style-type: none">• Add student• Add teacher• delete student• delete teacher• view student details• add advertisement• view grades• print certificate

4.4 System Requirements

Before beginning the development of the system, it is important to determine all the features that the system should have (Sommerville, 2007). Also, how users will interact with the system and how the system should perform its operations and interact with users.

Requirements are the essential part in the system, it is a statement that define a capabilities, characteristics, and quality factors of the system in order to have values and utilities to the users. After the requirements set, developers can initiate the technical work including the design of the system, development, testing, implementation and operation (Young, 2004).

Each system has functional and non-functional requirements; the functional requirements are the user features that are connected with stakeholders of the system, just like login, view grades, and edit information.

As for the non-functional requirements, its requirements that describes the factors which support the system, for example; security, integrity, reliability, maintainability.

4.4.1 Functional Requirements

The system's functional requirements were identified by interviewing specialist people, using similar systems, and discussing requirements with team members.

Each user of the system has his own functional requirements that describes what the system should do.

4.4.1.1 Student requirements

Each student who use the system should be able to perform his requirements through the system. Those requirements are:

- Student should be able to login to the system
- Student should be able to view available exams
- Student should be able to solve his exam
- Student should be able to upload files to the system
- Student should be able to view his grades
- Student should be able to print his certificate
- Student should be able to edit his information
- Student should be able to see the advertisements

4.4.1.2 Manager requirements

The manager have permission to perform too many tasks in the system, he has many functional requirements. It includes:

- Manager must be able to add users to the system.
- Manager should be able to view all students' details.
- Manager can edit the information of the students.
- Manager should be able to add advertisements.
- Manager must be able to view all students' grades.
- Manager can see all available courses.
- Managers should be able to manage users of the system.

4.4.1.3 Teacher requirements

Teacher is another important aspect of the system, he also has many functional requirements. Those functional requirements are:

- Teacher should be able to see the information of the students that he teach.
- Teacher should be able to add exam to his students.
- Teacher should be able to open a form to upload files and receive homework.
- Teacher should be able to see the grades of his students.
- Teacher should be able to change student's mark.
- Teacher can post an advertisement for his students.

4.4.1.4 Secretary requirements

The secretary has too many functions to perform, he has authority to perform functions that the students and teachers can't perform. His functional requirements include:

- Secretary should be able to add users to the system.
- Secretary should be able to view student's details.
- Secretary should be able to edit the information of the students.
- Secretary should be able to add advertisements.
- Secretary should be able to view student's grades.
- Secretary should be able to see all available courses.

4.4.2 Non-Functional Requirements

There are many non-functional requirements for this project that are mentioned below:

1. Usability:

Usability requirements are the attributes of quality and the degree of ease of using the system, and the satisfaction of users using the interface. Ekhtaberni achieve usability because it designed to be easy to use and easy to learn, and it has an attractive interfaces.

It also includes efficiency, memorability, learnability, no errors, and the satisfaction of the users who are using the system.

- **Ease of use:**

- Clear bath of using the system and the system is well-understood.
- GUI: the appearance of the system and interfaces are attractive.

- **Handling errors:**

- Minimize the number of errors that the users may face as much as possible.

- **Attractive design:**

- The interface that will be used and interact by the users should be attractive and satisfy the users

- **Learnability:**

- The users can easily learn how to use the system.

- **Simplicity:**

- The system should be easy to learn and easy to use.
- The system should be able to perform tasks quickly as possible.
- The system should have simple interface and clear options.

2. Security:

It's important to insure the access of authorized users to the system and to insure that the data of the system are private can't be hacked or damaged.

Ekhtaberni prevents any unauthorized access and required a password that is restricted by several rules.

Security requirements include integrity, authorization, availability, confidentiality, and authentication.

- **Availability:**
 - The system is available all the times and not stopped.
 - Backup the data of the system every day.
 - The daily transactions should be recorded.
- **Authorization:**
 - The admin is the only user who can give permissions and add teachers or students.
- **Confidentiality:**
 - The admin should determine the characteristics of the passwords in order not to accept any easy password that is easy to hack or guess.

3. Performance:

The speed of doing operations must be in consideration, performance requirements may include response time, recovery time, and start up time.

- **Response:**
 - The system must be respond to all users in short time.
 - The system should respond to the reaction of the users.
- **Scalability:**
 - The ability of the system to get bigger and handle large amount of information.
 - The ability of the system to deal with increased load on the system with increased throughput.

4. Reliability:

The ability of software to maintain its level of performance under a set of conditions.

- **Dependability:**
 - The system is trusted by users because it Achieve high level of security and it minimize the errors as possible, and the system can auto-save the grades before submitting it.
- **Availability:**
 - The system is available when any service requested in any time and not overloaded and the system can handle large number of users.

5. Efficiency:

- The system is fast in responding for the requests.
- The system is able to handle many users and transactions in the same time.

6. Effectiveness:

- The system perform its tasks effectively and “do things right” by doing what is required from it.

7. Flexibility:

- The system is flexible, easy to use, easy to learn, and modifiable. It designed in a way that lead to achiving usability and in contain suitable interfaces.

8. Maintainability:

- The ability to make changes to the system if there is an error.
- The system is easy to repair and maintain.

9. Adaptability:

- The system is responsive and can be opened in any browser at any platform, and the layout of the system changing from device to device according to the size of its screen.

4.5 System Analysis

This section will contain the analysis of the functional and non-functional requirements by using use case diagrams and its details. Also, sequence diagrams and activity diagrams will show the interaction behavior of each activity.

1.6.1 Use case diagram

Use case diagrams will be developed to capture the dynamic aspects of the system. It will show the interactions between the four types of users of the system. Students, Teachers, Manager, and secretary will have a common functions which are: Login, change password, and log out. Each one of the can login to the system by filling user name and password fields and pressing login bottom. In addition, they can change their passwords by putting the old password and submission of the new password.

For the students, he can attend to the available exams that his teacher provide, also he can view his own grades or total average after finishing solving the exam. He can also submit a solution of the assignments that teachers provide and upload files if needed.

After finishing his study, student is able to view his own certificate and print it.

Also, Teachers can add an exam which has a specific questions that the teacher provide, they also can add an assignment for the students and open form to submit the solution of the assignment. In addition, teachers can upload files for their students like a PowerPoint slides or word documents. Also, there are advertisements that the teacher is able to add, like the times of exams for example.

On the other hand, Manager has all the permissions of the system, he can add secretary who is also make the functions of the manager, also he can add student, add teacher, delete student, and delete teacher. In addition, he can view the details of students including the average and his grade, and the details of the teachers including the employment number and the classes that he teach. Also, he is able to add advertisements and print the certificates of the students.

For the secretary, he has too many functions to perform who has authority form the manager. He can add student, delete student, add teacher, and delete teacher. He also has access to student's details and their grades, and print their certificates. See Figure 4.1.

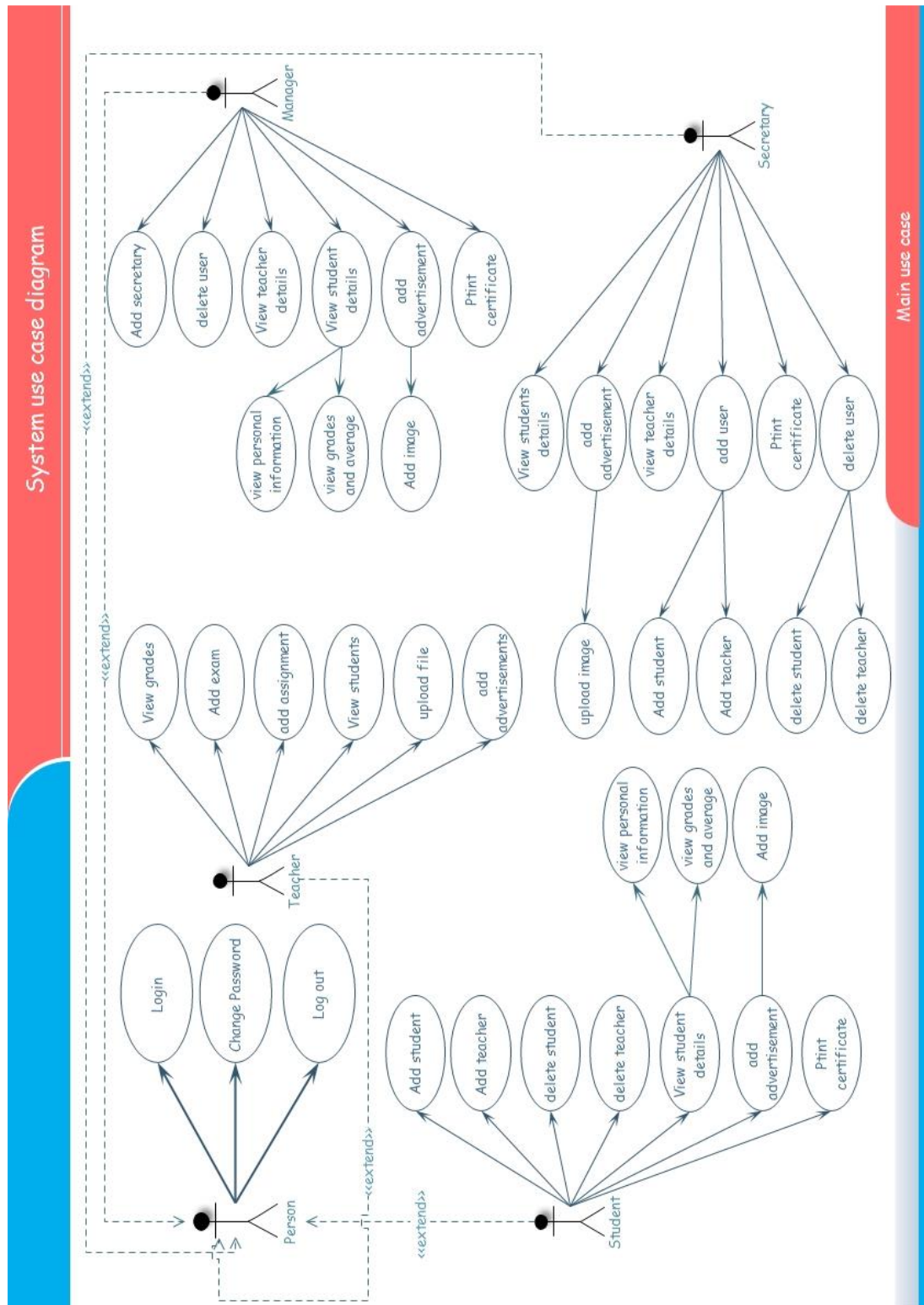


Figure 3 System use case diagram

1.6.2 Activity diagram

Activity diagram is a diagram that represent the flow from an activity to other activity. Activity diagram can be defines as a system operation. This flow can be sequential, branched or concurrent. The activity diagrams that are related to the main functions of the manager includes add student, delete student, and the same for the teacher. Also, it includes editing the details of each user of the system. Figure 4.2 shows delete student activity diagram that is performed by the manager.

There are other activity diagrams that is performed by student and teacher that shown in appendix A.

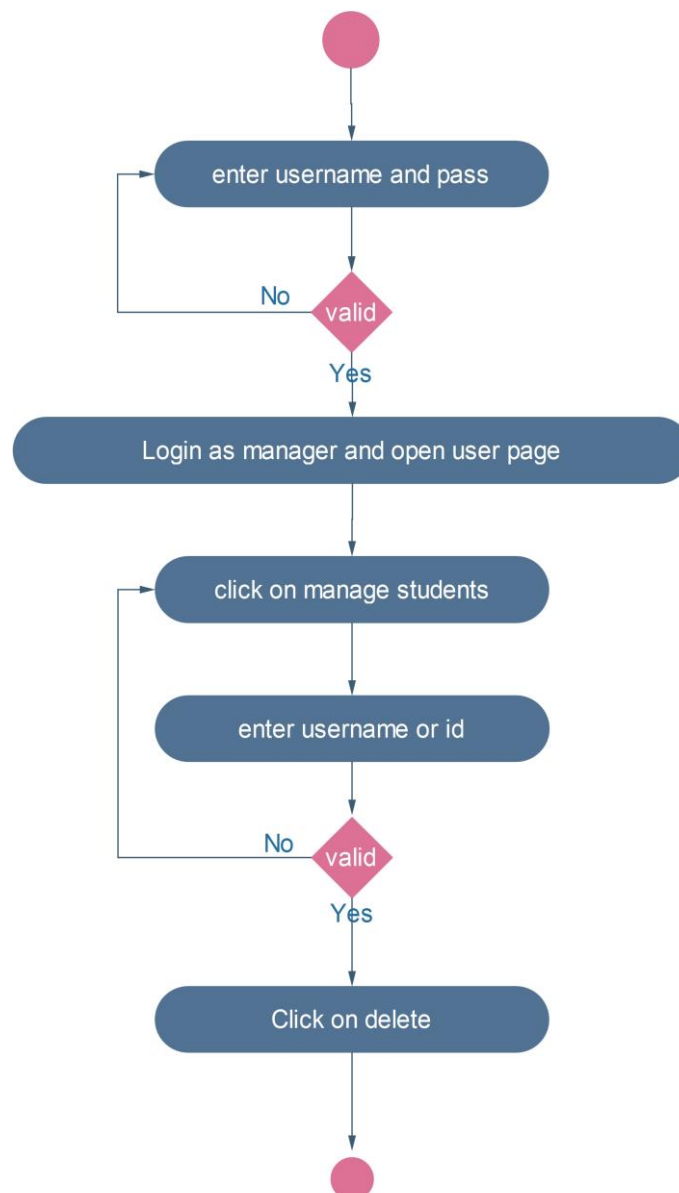


Figure 4 delete student activity diagram

1.6.3 Sequence Diagram

Sequence diagram show the interaction between objects over time, which called interaction diagram.

If the manager want to add new user even student, teacher, or secretary to the database, he must login to the website by putting username and password. The site check that username and password are correct from database. Once he login successfully, the home page of the manager will be opened. In order to add new user, manager have to click on add user button and the system will open a form that request the information required to all this user. After that, the manager fill the form with correct information and then the system check the information if it is correct or not. After that, the system will export the information to the database to be recorded in tables. Finally, after inserting the information, the system will display a message that tells that the operation done correctly. See Figure 4.5.

There are another sequence diagrams such as delete user, change password, and add exam that are described in [Appendix B](#) .

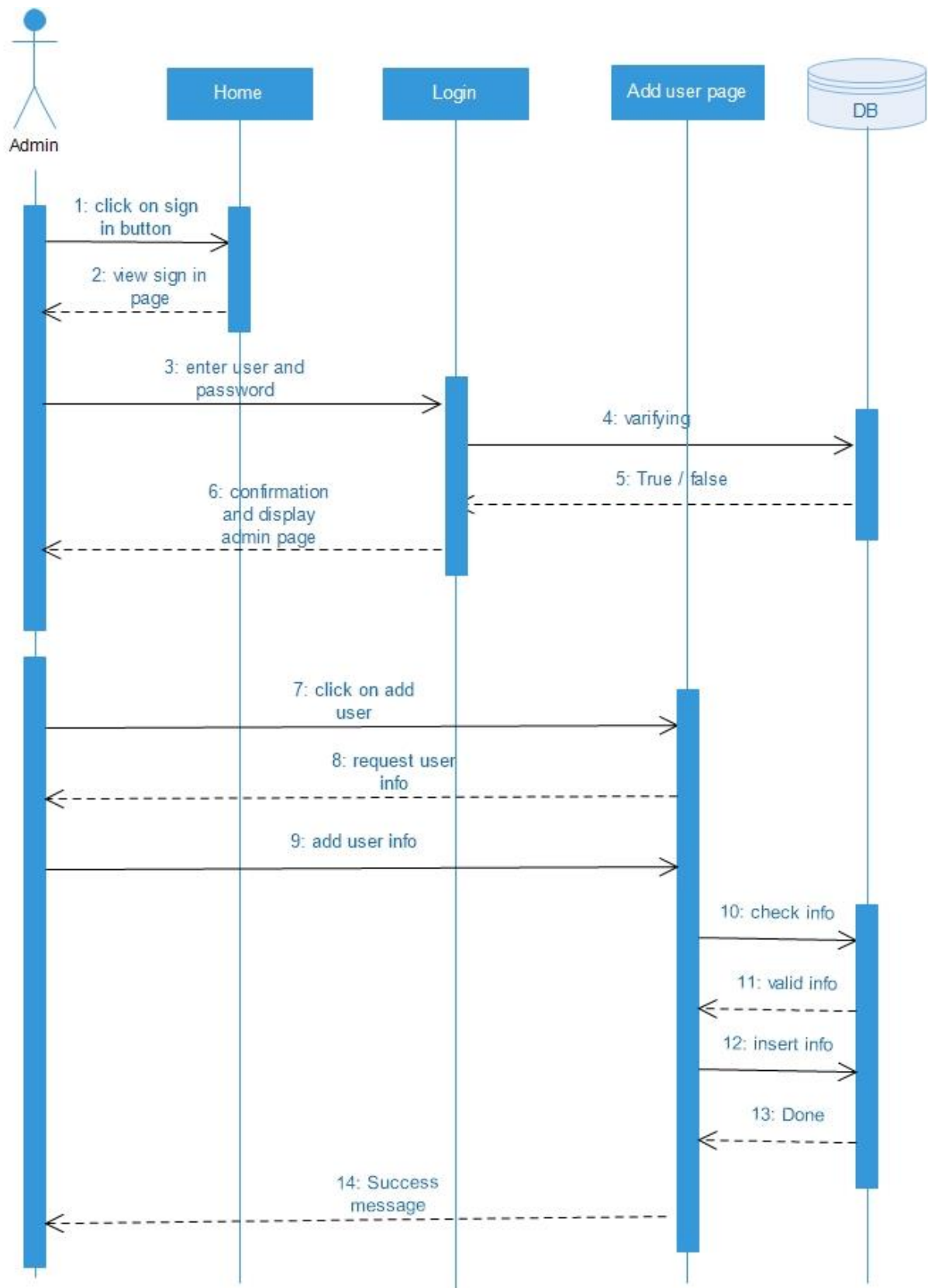


Figure 5 Add user sequence diagram

CHAPTER 5

DESIGN AND IMPLEMENTATION

5.1 Introduction

The design and implementation phases of the system will be described in this chapter. It contains ER diagram, class diagram, and database schema. Also, the implementation phase use a combination of requirements and design phase outputs and process them using appropriate technologies.

5.2 Design phase

In this phase, the relationship between classes will be designed and analyzed using class diagram. Then, the database schema will be developed. And finally, the relationships between entities will be shown in the ER diagram.

5.2.1 Class diagram

Class diagram was developed to illustrate the relationships and source code dependencies between classes. The class defines the variables and methods in any object, which is a specific entity in a program, system or unit of code that is representing that entity. The class diagram of the proposed system is shown in Figure 5.1.

In Figure 5.1 there are fourteen classes, which are placed in a way that represents the common interactions and connections between classes.

The class diagram is consists of classes that are represented in boxes, each box has three parts. The first part contains the name of the class, the second part contains the attributes of the class, and finally the third part contains the methods performed by the class. Also, there are lines between classes that represents the relationships between them.

Take an example, in user class, there are attributes that are associated with it, include: user ID, full name, email, password, address, and phone number. Each variable may be an integer or a set of characters.

Also in user class, there are three methods that identified, which are: login, logout, and change password.

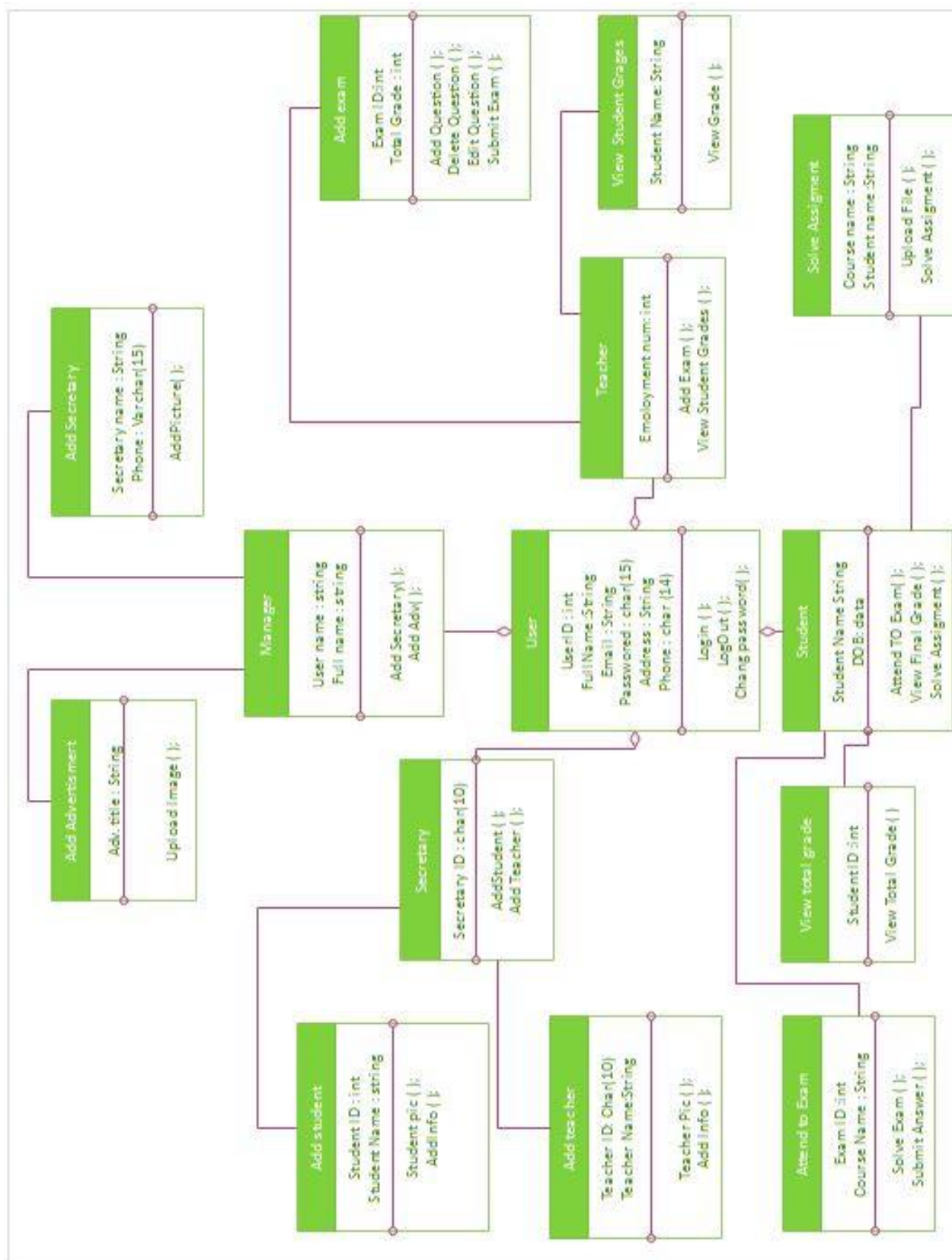


Figure 6 Class diagram

5.2.2 Database Schema

Database schema is the skeleton structure that represents the logical view of the entire database, It defines how the data is organized and how the relations among them are associated. It formulates all the constraints that are to be applied (Ma, 2005).

The system has five databases schema. Each table contains primary key, which is ID, and another attributes related to different functions in the system. For example, the course table contains attributes like Course ID, Course name, Number of students, Teacher Name, Teacher Number, and Teacher ID. See Figure 5.2

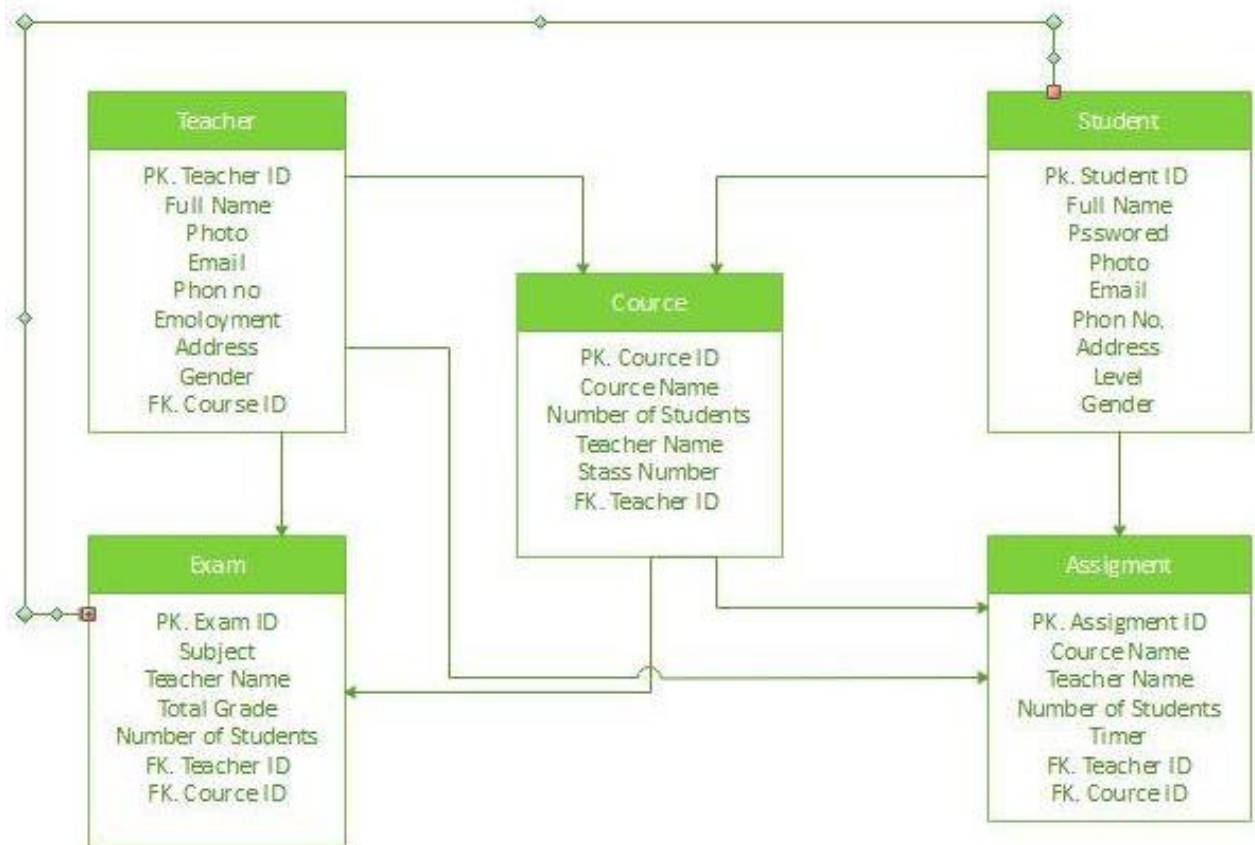


Figure 7 Database Schema

5.2.3 Entity Relationship (ER) Diagram

An Entity Relationship (ER) diagram is a graphical representation of entities and their relationships to each other, typically used in computing in regard to the organization of data within databases or information systems (Singh, 2011).

It help in defining business processes and can be used as the foundation for a relational database.

As shown in Figure 5.3, there are five database tables. It views the relationships between the tables, for example, Teacher make exam and course. Also, Student solve assignments and exams.

Moreover, each database table has many attributes that are related to it. For example, Assignment database include Assignment ID, Teacher Name, Timer, Course Name, Course ID, Teacher ID, and Number of students.

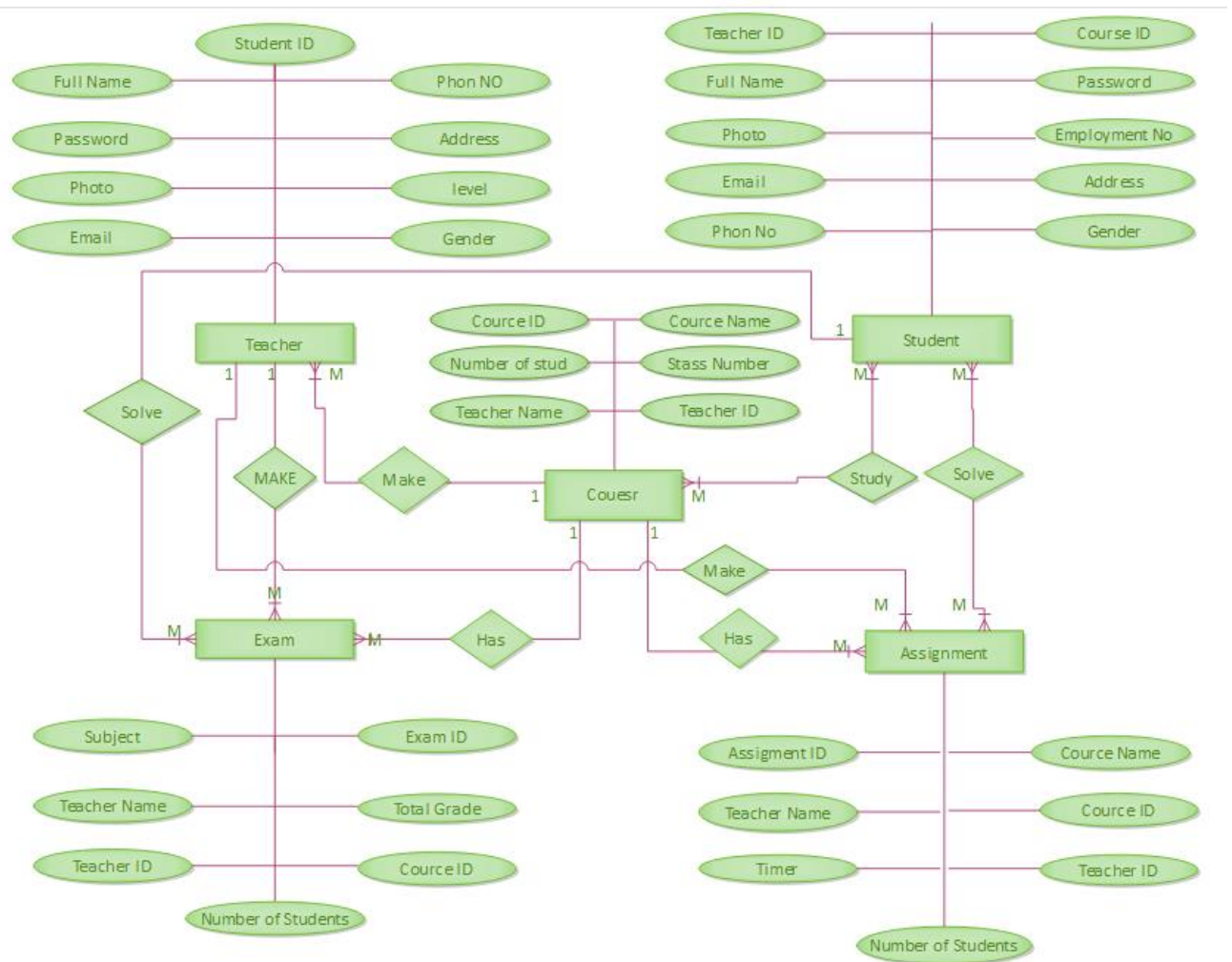


Figure 8 Entity Relationship (ER) Diagram

5.3 Implementation Phase

The implementation phase comes after developing the database of the system. Though this phase, many activities and techniques were used to develop the website. The first step of development of the website is designing the website structure using HTML5, then the style of the website was designed using CSS3. Moreover, dynamic website and enhanced user interfaces were developed using Java Script and JQuery. Finally, the website contents and databases were managed using PHP7. See Fig 5.4

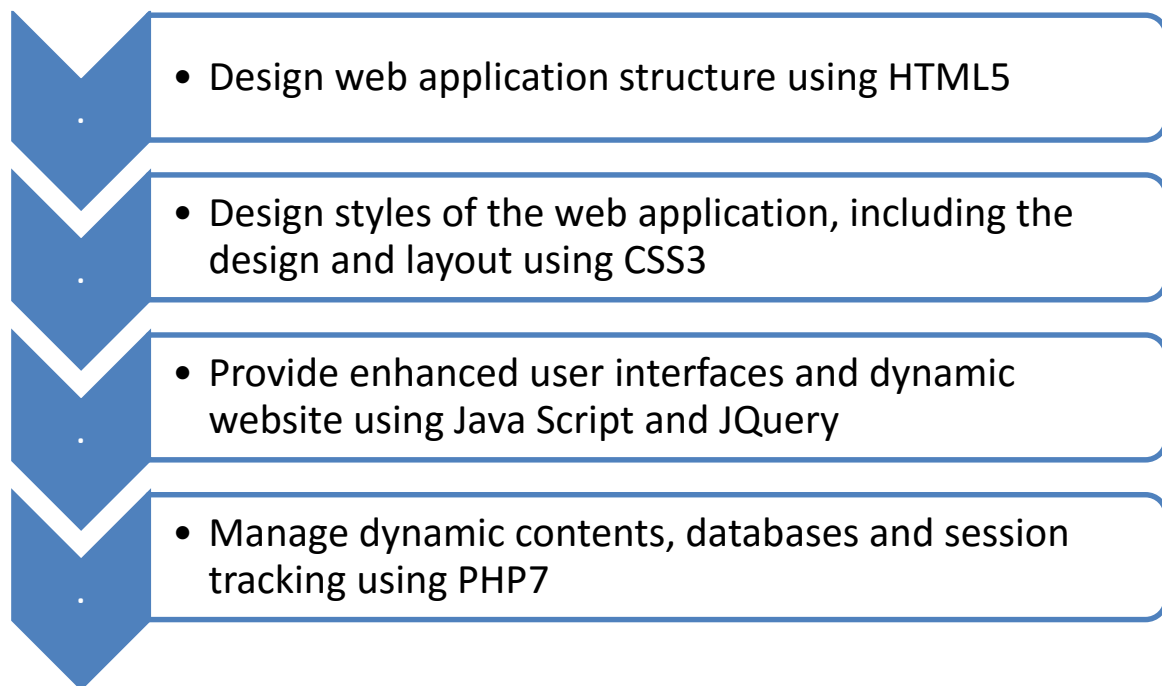


Figure 9 Implementation of the web system

5.3.1 User Interfaces

This section represents some of interfaces of the website on computer and mobile.

Figures 5.5, and 5.6, shows the home page, and the admin and manager's control panel.



Figure 10 Home page

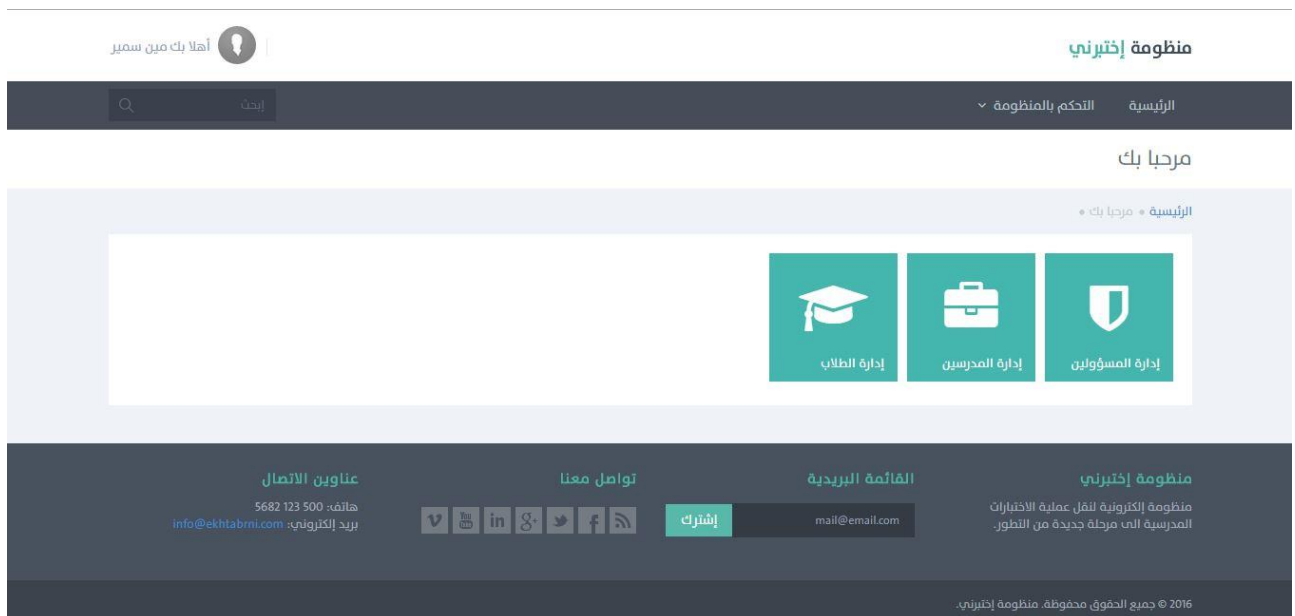


Figure 11 Admin control panel

Figure 5.7 and 5.8 shows teacher control panel and home of mobile version.

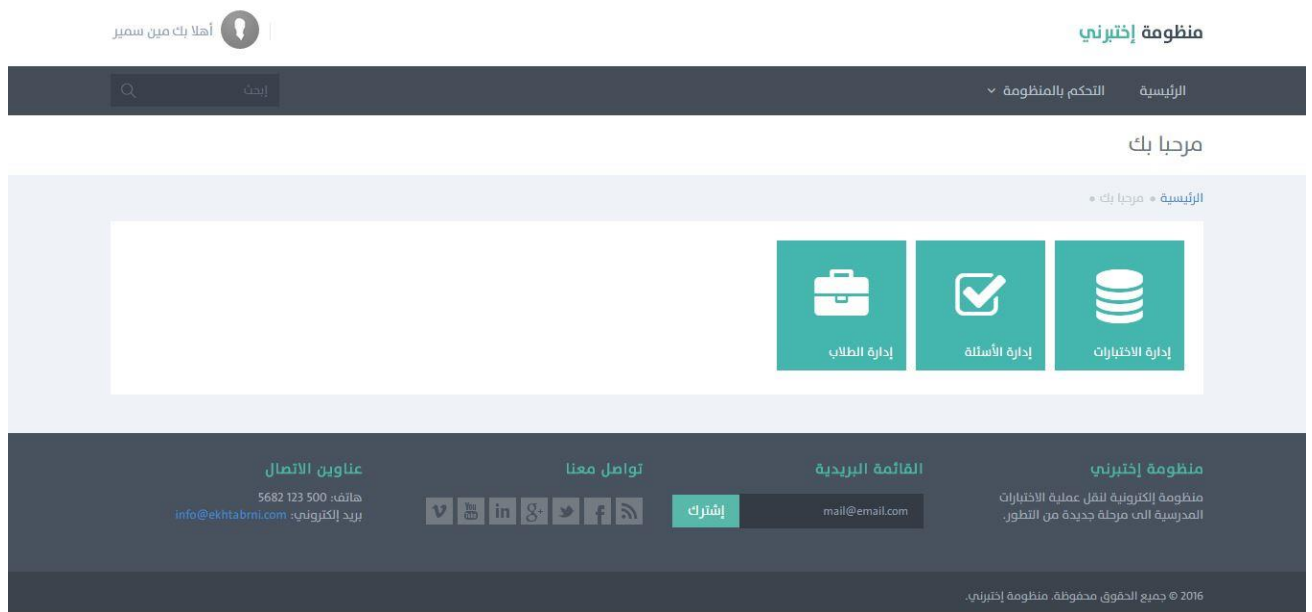


Figure 12 Teacher control panel



CHAPTER 6

TESTING AND EVALUATION

6.1 Introduction

Testing and evaluation phase will be explained in this chapter. Testing phase will view the performance testing and functionalities of the system. In addition, the evaluation was performed on students and teachers.

6.2 Testing

There are two types of testing that performed for testing the website, which are performance testing and functionality testing.

6.2.1 Performance Testing

The website was tested on Google chrome browser using YSLOW tool that analyze web pages according to many rules. Then evaluate the score of each rule for the tested website. The rules (Mohanna; Abu kashef; Hussain; Abd el-ati, 2016) that are tested by YSLOW tool are identified in Table 6.1.

Table 4 Tools used for testing the website

1. Make fewer HTTP requests	2. Remove duplicate JavaScript and CSS
3. Use a CDN	4. Configure ETags
5. Avoid empty src or href	6. Make AJAX cacheable
7. Add Expires headers	8. Use GET for AJAX requests
9. Compress components with GZip	10. Reduce the number of DOM elements
11. Put CSS at top	12. Avoid HTTP 404 (Not Found) error
13. Put JavaScript at bottom	14. Reduce cookie size
15. Avoid CSS expressions	16. Use cookie-free domains
17. Make JavaScript and CSS external	18. Avoid Alpha Image Loader filter
19. Reduce DNS lookups	20. Do not scale images in HTML
21. Minify JavaScript and CSS	22. Make favicon small and cacheable
23. Avoid URL redirects	

The website was tested using this tool, and the results showed that the system belongs to grade D, which is a good grade as shown in Fig. 6.1

Grade	Suggestion
F	Make fewer HTTP requests
F	Use a Content Delivery Network (CDN)
A	Avoid empty src or href
F	Add Expires headers
F	Compress components with gzip
A	Put CSS at top
A	Put JavaScript at bottom
A	Avoid CSS expressions
n/a	Make JavaScript and CSS external
A	Reduce DNS lookups
C	Minify JavaScript and CSS
A	Avoid URL redirects
A	Remove duplicate JavaScript and CSS
F	Configure entity tags (ETags)
A	Make AJAX cacheable
A	Use GET for AJAX requests
A	Reduce the number of DOM elements
A	Avoid HTTP 404 (Not Found) error
A	Reduce cookie size
F	Use cookie-free domains
A	Avoid AlphaImageLoader filter
A	Do not scale images in HTML

Grade F on Make fewer HTTP requests

This page has 13 external JavaScript scripts. Try combining them into one.
 This page has 9 external stylesheets. Try combining them into one.
 This page has 15 external background images. Try combining them with CSS sprites.

Decreasing the number of components on a page reduces the number of HTTP requests required to render the page, resulting in faster page loads. Some ways to reduce the number of components include: combine files, combine multiple scripts into one script, combine multiple CSS files into one style sheet, and use CSS Sprites and image maps.

[»Read More](#)

Copyright © 2016 Yahoo! Inc. All rights reserved.

Figure 13 Using YSlow tool

6.2.2 Functionality Testing

The functions, database connection, forms that are used for entering data and submission, editing or deletion from users were tested.

Some functionalities that are tested:

1- **Security:**

Security was tested by copying and pasting the URL directly to the web browser without login.

2- **Database:**

The data consistency and integrity were confirmed. Also, the errors while editing, deleting, modifying, or any database functionalities were checked.

3- **Mobile devices:**

The website is responsive for all types and sizes of screens, so, the website was opened in many mobile devices to insure compatibility with all devices such as iPhone 5s, iPhone 6s, Samsung galaxy s4, and Sony z2.

6.3 Evaluation

It is important to take users opinion of the system, so a questioner has been distributed into two types of users; teachers and students.

6.3.1 Usability Evaluation

Usability is the most important attribute of the system quality and in includes efficiency and effectiveness. It also include the satisfaction of performing the system's tasks by users.

“A usable system is one that enables users to perform their job effectively and efficiently“ (Alzaza, 2012).

Usability also describes the quality of user experience of using the system and interacting with it weather on pc or mobile or any interacting device. The process of evaluation the system is an essential part of the system development process.

Traditionally, the concept of usability has been defined in multiple different ways (Francesca; Maristella, 2006), basically on one of the following bases:

- 1- Semantic: ease of use or user-friendly without formal definition of the properties of the system.
- 2- Features: the existence or absence of certain features in the user interface such as icons, menus, or windows.
- 3- Operations: performance and effective levels that are clear to users for certain task and environmental scenarios.

6.3.2 End User Evaluation

Thirty teachers and forty students were selected from two schools in order to evaluate the system based on the users of the system. They have been asked to use the website using computer devices and mobile devices. After trying the system, a questioner was given for teachers and another questioner was given to students. The questioner was divided into two parts; the first one includes general information about the user who fulfill the questioner including the gender, age, qualification, and their experience in using the web systems, websites and mobile applications.

The second part of the questioner is to evaluate the system, it includes four groups. Each group evaluates the participant's opinion about specific consideration about the system. The data was entered, filtered, and analyzed using SPSS. The questioner is shown in Appendix A.

As shown in Fig 6.3, 57% of the participants were students while 43% were teachers. In addition, 64% of participants were males while 36% were females as shown in Fig 6.4.

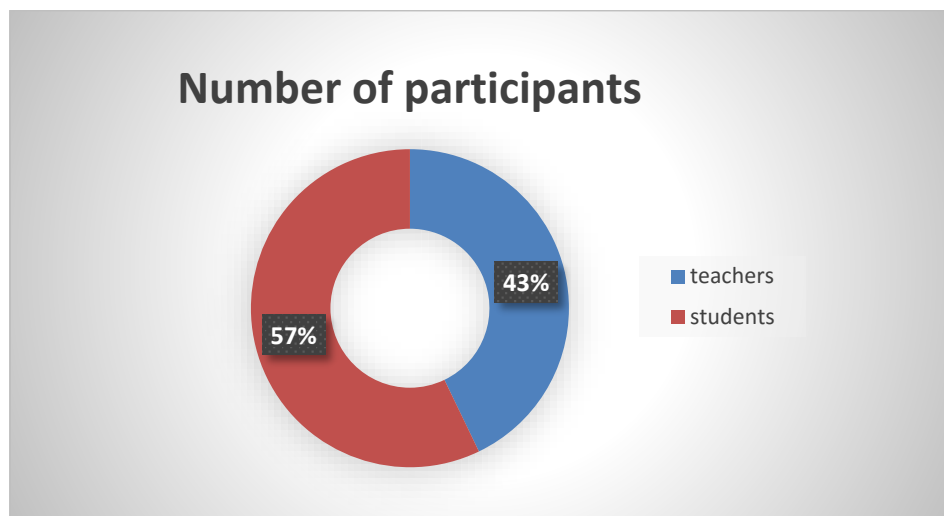


Figure 14 Number of participants

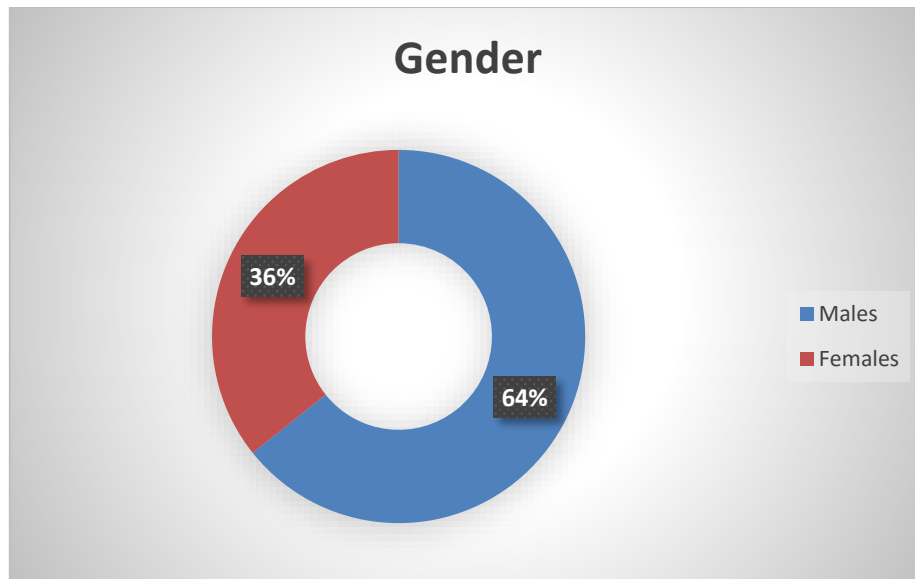


Figure 15 Gender percentage

As you see in Fig 6.5, 60% of teachers were aged from 25 to 45 years old, 27% were more than 45 years old and 13% were less than 25 years old. In other words, most of participants were males aged between 25 and 45 years old.

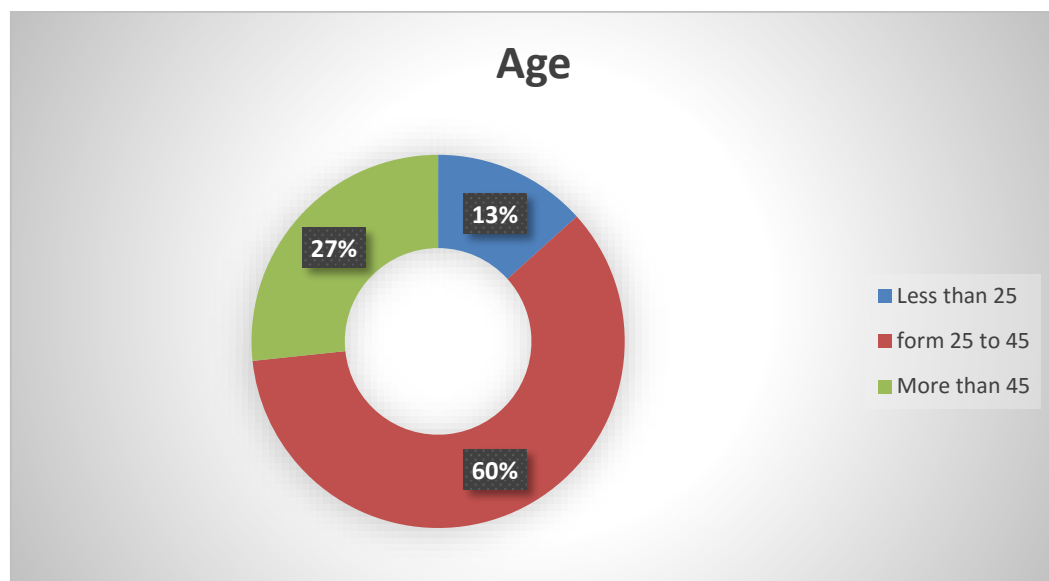


Figure 16 Age percentage

In the other hand, the biggest percentage of qualification was the teachers who finished studying Bachelor, which is 50%, 30% for diploma, 17% for master, and the lowest percentage, 3% for trainers as shown in Fig 6.6.

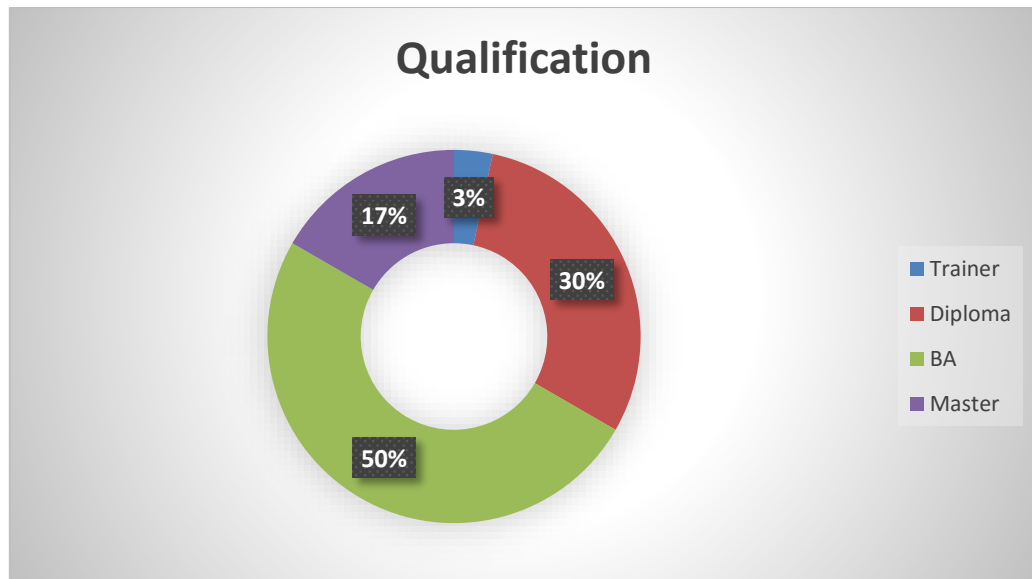


Figure 17 Qualification

In term of experience of using the web, as shown in Fig 6.7, %37 have been using the web for more than 5 years, 30% have been using the system from 3 to 5 years, 30% for less than 3 years, and finally 13% were never used the web.

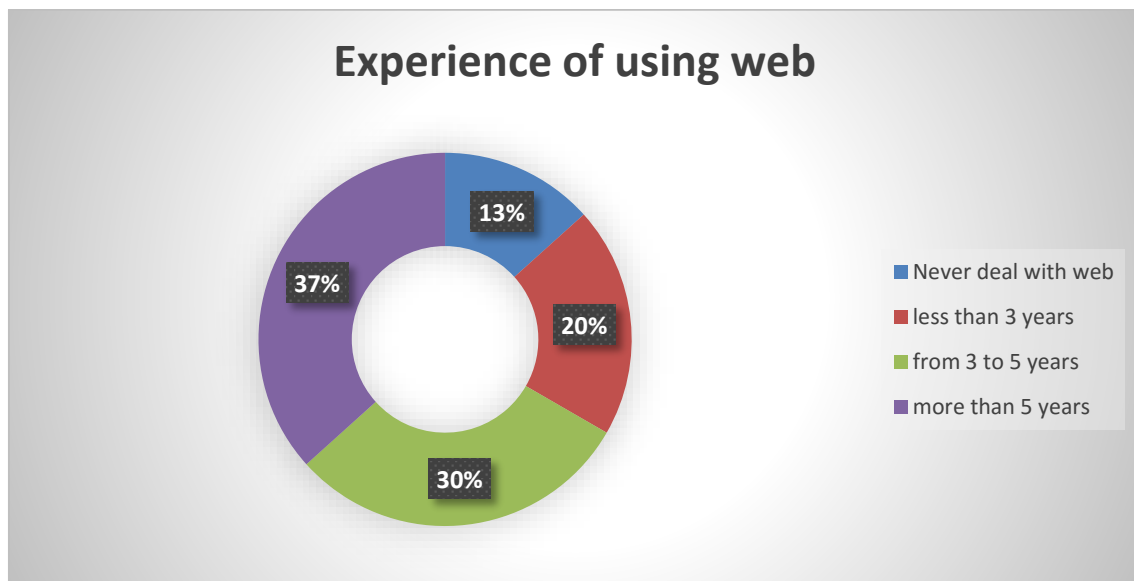


Figure 18 Experience of using the web

Regarding to the perceived usefulness of the system, participants were asked to evaluate the importance of the system and how it easy to perform tasks effectively using the system. About 53% of participants were strongly agree that the system enables them to perform tasks faster, while nearly 35% of them were agree.

In other hand, 48% of participants strongly agreed that the system help improving the performance of learnability. Where about 35% were agree. Moreover, nearly the same percentage agreed that the system help improving the productivity of education, See Fig 6.7.

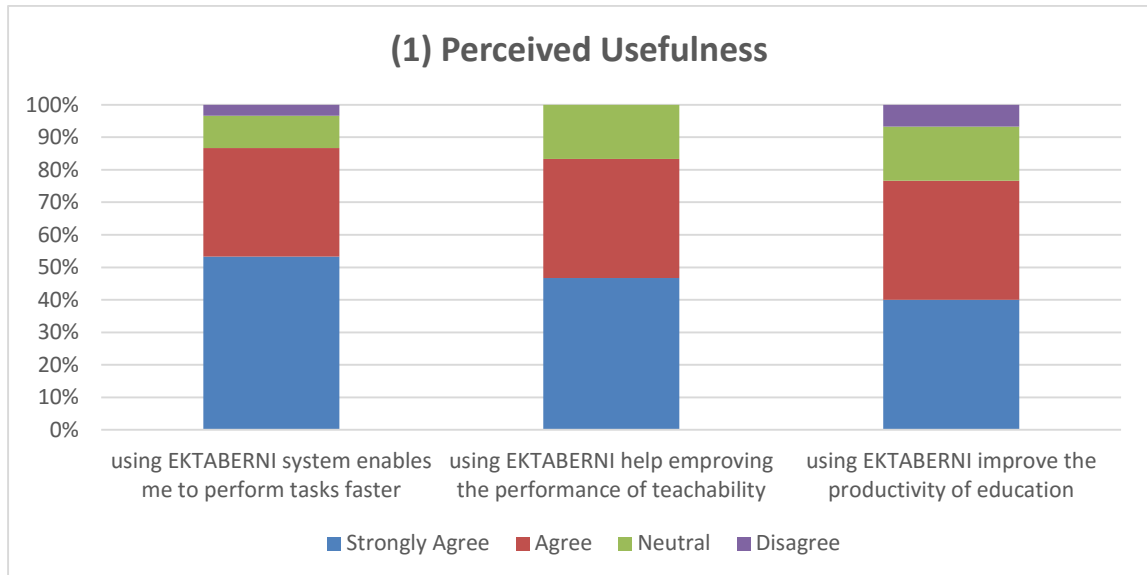


Figure 19 End-users' perceptions about the usability of the system (1)

About 68% were strongly agree that using the system enhancing the effectiveness of learning environment, while 20% were agree.

In addition, 38% of participants were strongly agree that using the system facilitate engaging in learning environment, but nearly 45% were agree.

The last one of perceived usefulness was finding benefit using the system in education environment that 33% of participants strongly agreed on it while 28% were agreed. See Fig 6.8.

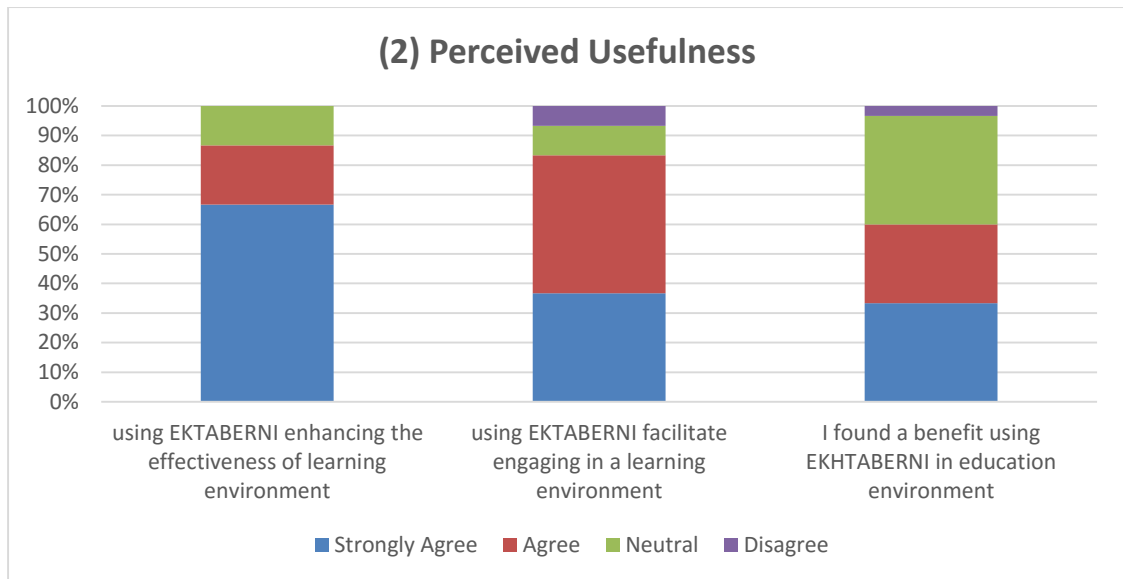


Figure 20 End-users' perceptions about the importance of the system (2)

Regarding to the ease of using the system, most of participants founded that the system is easy to use and easy to learn, which is validate usability concept (Dix, 2009).

Fig 6.9 shows that nearly 48% were strongly agree and 28% were agree that the system is easy. In addition, 50% of participants were strongly agree and 31% were agree that the system make it easy to find what they want. Otherwise, 32% of them were strongly agree that the system is cleat and understandable, while 28% were agree.

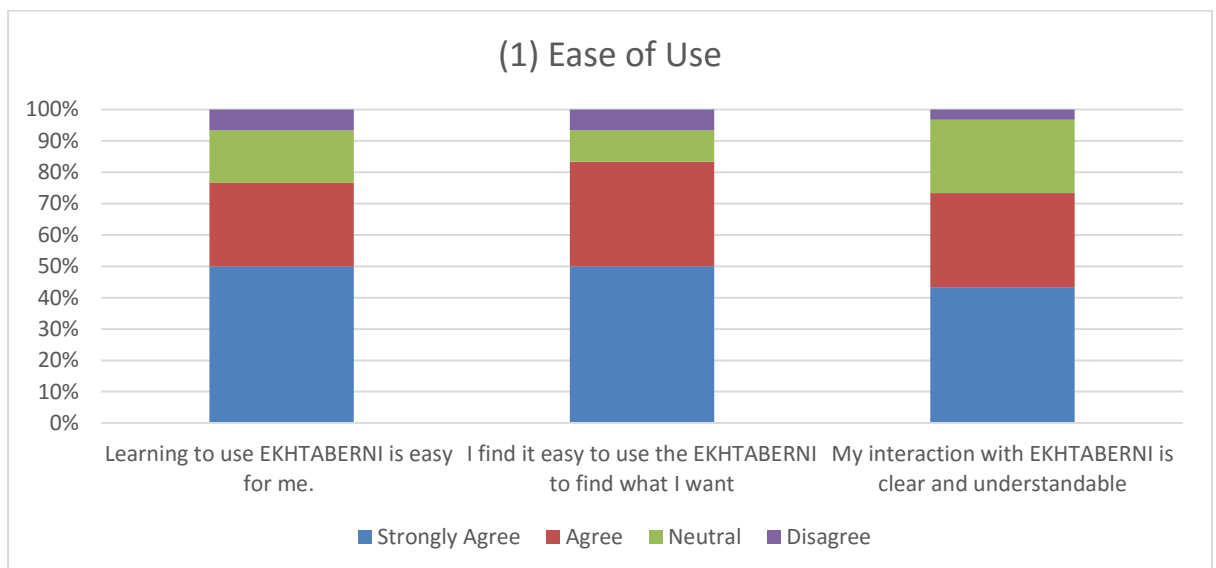


Figure 21 End-users' perceptions about the ease of use of the system (1)

Nearly 40% of participants strongly agreed that the system is flexible to interact with, while 30% were agree. In addition, 50% founded that it easy to become skillful in using the system, they was strongly agreed, while 30% were agreed on that.

The overall result of this part, most of the participants agreed that the system in general is easy to use, 67% were strongly agree, 25% were agree, 8% were neutral, and no one see that the system is not easy to use. See Fig 6.10.

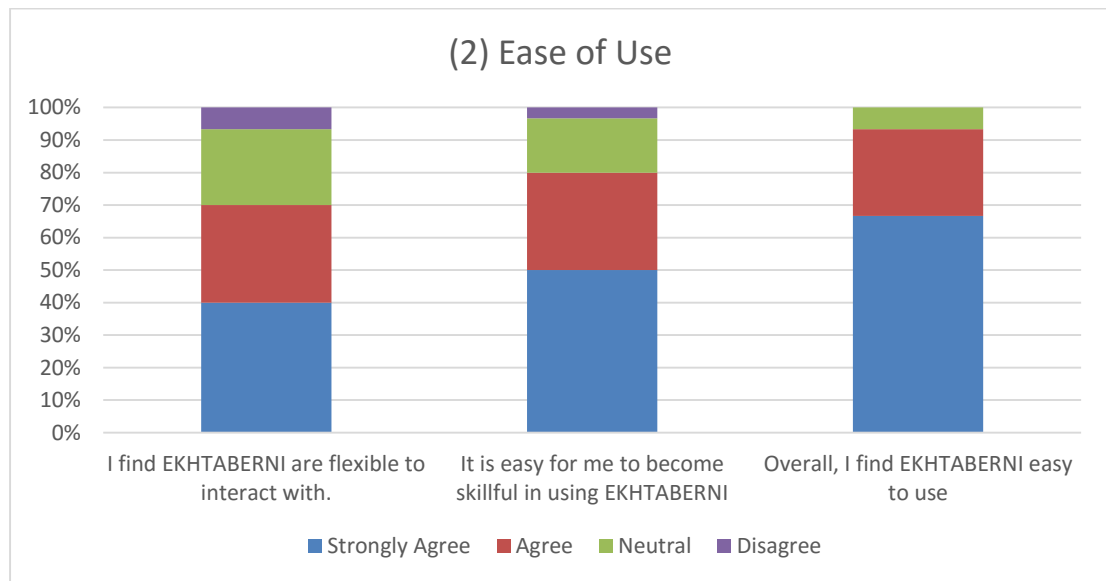


Figure 22 End-users' perceptions about the ease of use of the system (2)

Regarding to learnability concept, 50% of participants says that the system is easy to learn and easy to use in a big degree, while 48% agree that the system is useful, easy to use, and easy to learn. In addition, most of participants founded that there is no information to read before using the system.

At the end, 48% of participants strongly agreed that the information provided by the system was easy to use, while 20% of them agreed on that. See Fig 6.11.

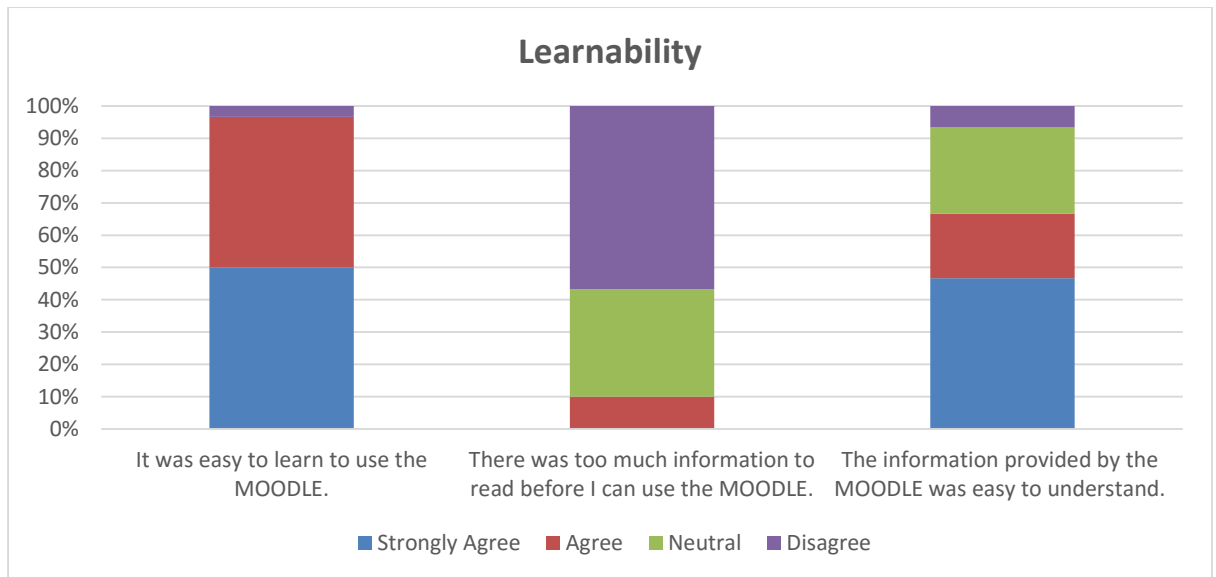


Figure 23 End-users' perceptions about the learnability of the system

The last section aims to measure the degree of satisfaction of using the system and if there are problems to solve or features to add in future work. Fig 6.12 shows that 42% of participants strongly agreed that they were able to complete their tasks quickly using the system and 30% agreed on that. Also, 52% were strongly agreed that they could effectively complete their tasks using the system, while also 30% agreed on that. Regarding to the ability to efficiently complete the tasks using the system, 57% were strongly agreed and 29% were agreed on that.

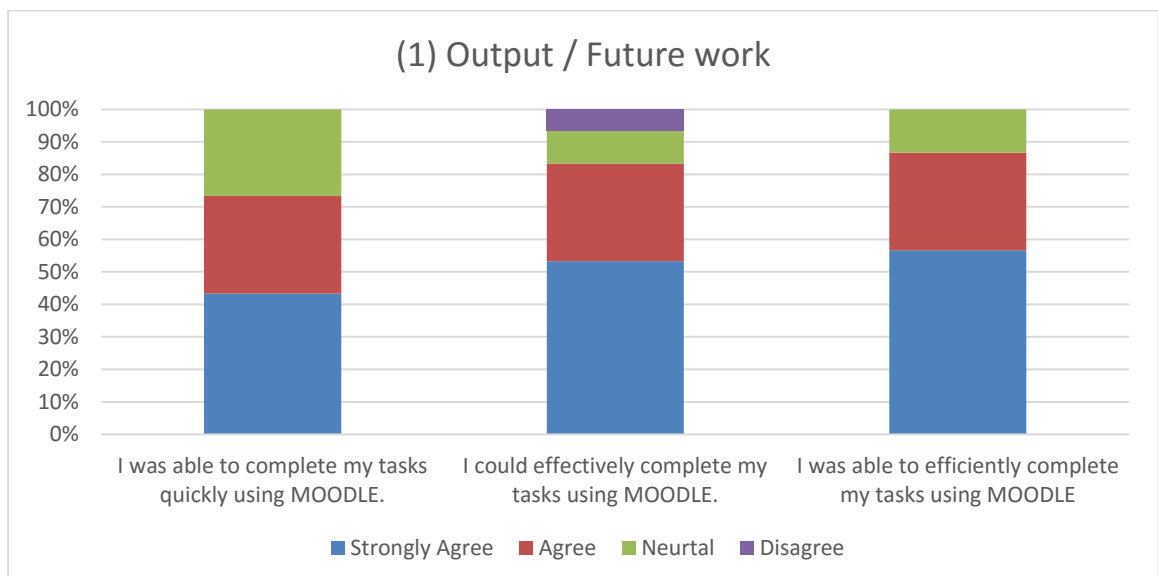


Figure 24 End-users' perceptions about output and future work of the system (1)

Regarding to the productivity, 48% of participants were strongly agreed that they could become productive quickly using the system, while 35% were agreed on that. In addition, the same rate of participants strongly agreed that they would use the system regularly, but 25% agreed on that. At the end, the biggest rate of participants strongly recommended the system. See Fig 6.13.

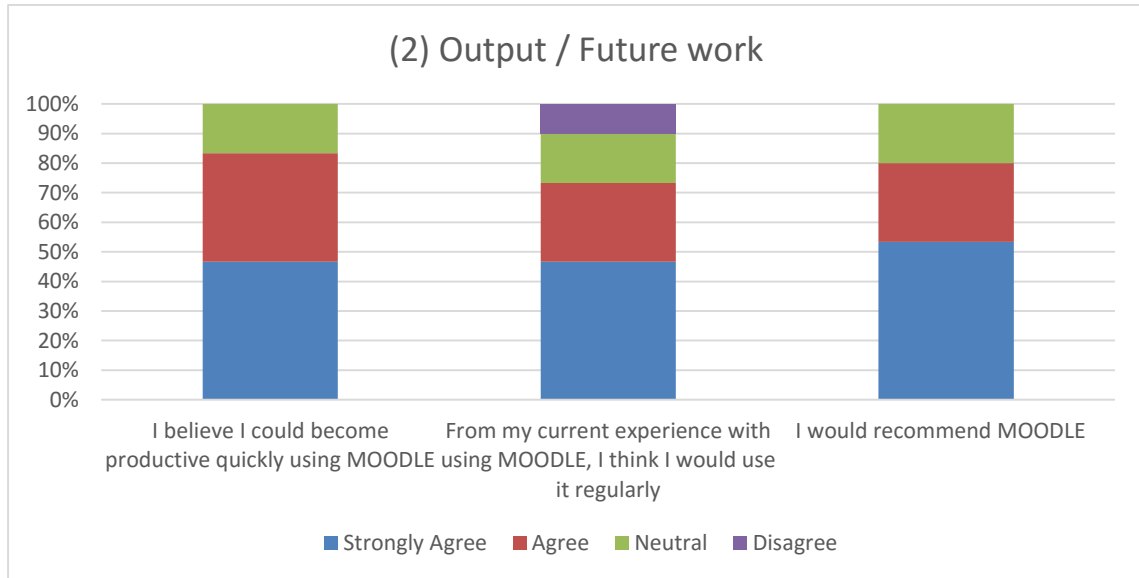


Figure 25 End-users' perceptions about output and future work of the system (2)

CHAPTER 7

CONCLUSION AND FUTURE WORK

This chapter contains the conclusion of the research and the suggested future work in order to develop the system, make it more reliable and make it able to satisfy customer requirements.

7.1 Conclusion

In recent years, with the age of rapid changes and technology development, people become more and more depending on the technologies in their lives. In the same time, the education sectors become more and more bigger in all over the world. In such environments, raising service quality and management performance are the foremost goals.

This project discussed the design and development of Electronic Exams System for schools. Waterfall methodology is used as the software development methodology to develop the system.

It began by examining the functional and non-functional requirements of the system through different brainstorming sessions, interviews with experts and e-survey. The functional and non-functional requirements were formed and analyzed using different UML techniques such as use case diagrams, sequence diagrams and activity diagrams.

The design of the system was then presented and analyzed using class diagram, database schema and ER diagram. After the design, the implementation of the design is discussed.

After that, the test analysis section, which discussed whether the proposed system met its objectives. Performance is also evaluated near the end of the paper along with possible extensions of the system.

According to the survey and the evaluation of the system, it can be estimated that the idea of Electronic Exams System is applicable and can be implemented in the schools.

7.2 Future Work

There are some features and ideas that can be considered as a future work for this project. These ideas and features can be summarized in the following points:

- Allow the system to support another languages like English and French in order to make the system accessible for foreign people.

- Apply the system in more than one school in order to expand the use of electronic exams in the schools in Gaza.
- Include more classes like 7th classes to 12th classes and targeting universities students.
- Add other types of questions; for example: matching, Complete, Explain, List, and define questions that the system will depend on algorithms to correct the answers according to specific key words that will be defined for every question.
- Insert a feature for the system that allow the system to send SMS messages to students or parents phones in order to keep them in touch with the school, like sending the total grade or send a message for students who have birthday, or even send news.

References

- Alzaza, N. (2012). *Research Methodology In Information Technology*. Gaza.
- Charvat, J. (2003). *Project Management Methodologies*. New Jersey: Jhon Wiley & sons.
- coursera. (2016). *coursera*. Retrieved from coursera: <https://www.coursera.org/>
- Dix, A. (2009). *Human-Computer Interaction*. United Kingdom: Springer US.
- Education, M. o. (2016, March 3). *eschool*. Retrieved from eschool: <https://www.eschool.edu.ps/>
- Jaswinder , S. (2014). *How to use Moodle 2.7*. Hyderabad: Packt.
- Lee , S. (2006). *Distance Education: Definition and Glossary of Terms*. USA: Information Age Publishing.
- Ma, Z. (2005). *Database Modeling for Industrial Data Management: Emerging Technologies and Applications*. Hong Kong: Idea Group Inc (IGI).
- Maristella, M., & Francesca, R. (2006). *Web Usability: Principles and Evaluation Methods*. Milano, Italy: Springer Berlin Heidelberg.
- Mendes, E., & Mosley, N. (2006). *Web Engineering*. New Zealand: Springer-Verlag Berlin Heidelberg.
- Mohanna, Abed; Abu kashef, Ahmed; Hussain, Yahya; Abd el-ati, Yousef;. (2016). *MealsOnWheels*. Gaza: University of palestine.
- Palestine, U. o. (2016). *Upinar*. Retrieved from Upinar: upinar.edu.ps/upinar
- Shilendra, K. S. (2011). *Database Systems: Concepts, Design and Applications*. India: Pearson Education India.
- Sommerville, I. (2007). *Software Engineering*. England: Addison Wesley.
- tv, D. (2015). *learn german*. Retrieved from dw tv: <http://www.dw.com/en/learn-german/deutsch-interaktiv/s-9572>
- Young, R. (2004). *The Requirements Engineering Handbook*. London: Artech House.

APPINDICES

استبيان

عزيزي المدرس،،

تهدف هذه الاستبانة لمعرفة مدى رضاك وقبولك لاستخدام نظام اختبارني الخاص بالامتحانات الالكترونية. مشاركتكم في الإجابة على هذا الاستبيان تساهم في ضمان نجاح هذه الدراسة، علماً أنه سيتم التعامل مع كافة المعلومات التي تقدمها بأكبر قدر ممكن من السرية.

شكراً على تعاونك معنا،،

للتواصل والاستفسار

حازم النخال – مهند عفانة – محمد النجار

جامعة فلسطين – مدينة الزهراء-غزة- فلسطين

info@ekhtaberni.com

أولاً: معلومات عامة:

هذا القسم يتعلق بالمعلومات الشخصية الخاصة بك، لذا يُرجى ملئ الفراغات ووضع علامة (√) حول الإجابة المناسبة (يُرجى وضع علامة واحدة فقط).

- 1- الجنس ذكر [] أنثى []
- 2- العمر أقل من 25 [] من 25 الى 45 [] أكثر من 45 []
- 3- المستوى التعليمي
[] متدرب [] دبلوم
[] بكالوريوس [] ماجستير [] أخرى _____

4- تجربتك مع نظم التعليم الالكتروني ؟

[] لم اتعامل مع أنظمة تعليم الكترونية [] أقل من ثلاث سنوات

[] ثلاث إلى خمس سنوات [] أكثر من 5 سنوات

ثانياً: عوامل قبول نظام اختبرني

بعد قراءتك للخيارات أدناه، يمكنك استخدام الأرقام من 1 إلى 5 كالتالي:

(1 = معارض بشدة ، 2 = معارض ، 3 = محايد ، 4 = موافق ، 5 = موافق بشدة)

1. تهدف هذه المجموعة من الأسئلة لفهم وجهة نظرك تجاه الفائدة من استخدام نظام اختبرني										
1	استخدام اختبرني يُمكنني من إنجاز المهام بسرعة أكبر.					1	2	3	4	5
2	استخدام اختبرني يُساهم في تحسين عملية التعليم					1	2	3	4	5
3	استخدام اختبرني يزيد من انتاجية التعليم					1	2	3	4	5
4	استخدام اختبرني يُساهم في تعزيز الفعالية في بيئة التعليم					1	2	3	4	5
5	استخدام اختبرني يُسهل عملية الانخراط في بيئة التعليم					1	2	3	4	5
6	أجد الفائدة في استخدام اختبرني في البيئة الدراسية					1	2	3	4	5

2. تهدف هذه المجموعة من الأسئلة لفهم وجهة نظرك تجاه سهولة استخدام نظام اختبرني										
1	أجد سهولة في كيفية تعلم استخدام نظام اختبرني					1	2	3	4	5
2	التفاعل مع نظام اختبرني واضح ومفهوم					1	2	3	4	5
3	أجد في نظام اختبرني مرونة للتعامل معه					1	2	3	4	5
4	من السهل بالنسبة لي أن أصبح ماهراً في استخدام نظام اختبرني					1	2	3	4	5
5	بشكل عام، أجد أن نظام اختبرني سهل الاستخدام					1	2	3	4	5

3. تهدف هذه المجموعة من الأسئلة لفهم مدى قابلية تعلم نظام اختبارني

1	كان من السهل تعلم استخدام نظام اختبارني	1	2	3	4	5
2	احتجت لقراءة الكثير من المعلومات قبل أن أتمكن من استخدام نظام اختبارني	1	2	3	4	5
3	المعلومات التي قدمها نظام اختبارني سهلة للفهم	1	2	3	4	5

4. تهدف هذه المجموعة من الأسئلة لفهم النتائج المترتبة على استخدام نظام اختبارني في المستقبل

1	كنت قادراً على إكمال المهام الخاصة بي بسرعة باستخدام نظام اختبارني	1	2	3	4	5
2	تمكنت من إنجاز مهامي باستخدام نظام اختبارني	1	2	3	4	5
3	كنت قادراً على إكمال المهام بكفاءة باستخدام نظام اختبارني	1	2	3	4	5
4	أعتقد أنني من الممكن أن أصبح عنصراً منتجاً بسرعة باستخدام نظام اختبارني	1	2	3	4	5
5	من تجربتي الحالية مع استخدام نظام اختبارني؛ أعتقد أنني سوف أستخدمه بشكل منتظم.	1	2	3	4	5
6	أوصي باستخدام نظام اختبارني	1	2	3	4	5

باختصار، هل لديك أي تعليقات أخرى؟

شكراً لتعاونك معنا

استبيان

عزيزي الطالب،

تهدف هذه الاستبانة لمعرفة مدى رضاك وقبولك لاستخدام نظام اختبارني الخاص بالامتحانات الالكترونية.

شكراً على تعاونك معنا،،،

للتواصل والاستفسار

حازم النخال – مهند عفانة – محمد النجار

info@ekhtaberni.edu

أولاً: معلومات عامة:

هذا القسم يتعلق بالمعلومات الشخصية الخاصة بك، لذا يُرجى ملئ الفراغات ووضع علامة (✓) حول الإجابة المناسبة (يُرجى وضع علامة واحدة فقط).

- 1- الجنس ذكر [] أنثى []
- 2- العمر أقل من 5 سنوات [] من 6 إلى 10 سنوات [] أكثر من 10 سنوات []
- 3- المستوى التعليمي
[] أول [] ثاني [] ثالث
[] رابع [] خامس [] سادس
- 4- تجربتك مع نظم التعليم الالكتروني والانترنت؟
[] لم تعامل مع أنظمة تعليم الكترونية [] سنة واحدة
[] أكثر من سنة

ثانياً: عوامل قبول نظام اختبرني

بعد قراءتك للخيارات أدناه، يمكنك استخدام الأرقام من 1 إلى 5 كالتالي:

(1 = معارض بشدة ، 2 = معارض ، 3 = محايد ، 4 = موافق ، 5 = موافق بشدة)

5. تهدف هذه المجموعة من الأسئلة لفهم وجهة نظرك تجاه الفائدة من استخدام نظام اختبرني					
1	استخدام اختبرني يُمكنني من إنجاز المهام بسرعة أكبر.				
2	استخدام اختبرني يُساهم في تحسين أدائي في عملية التعليم				
3	استخدام اختبرني يُسهل عملية التعليم				
4	أجد الفائدة في استخدام اختبرني في بيئة دراستي				
5	4	3	2	1	

6. تهدف هذه المجموعة من الأسئلة لفهم وجهة نظرك تجاه سهولة استخدام نظام اختبرني					
1	أجد سهولة في تعلم استخدام اختبرني				
2	التفاعل مع نظام اختبرني واضح ومفهوم				
4	من السهل بالنسبة لي أن أصبح ماهراً في استخدام اختبرني				
5	4	3	2	1	

7. تهدف هذه المجموعة من الأسئلة لفهم النتائج المترتبة على استخدام نظام اختبرني في المستقبل					
1	كنت قادراً على إكمال المهام الخاصة بي بسرعة باستخدام نظام اختبرني				
2	تمكنت من إنجاز مهامي باستخدام نظام اختبرني				
5	من تجربتي الحالية مع استخدام نظام اختبرني؛ أعتقد أنني سوف أستخدمه بشكل منتظم.				
6	أنصح باستخدام نظام اختبرني				
5	4	3	2	1	

شكراً لتعاونك معنا

Appendix C: User Interfaces

Figure C.1 and C.2 shows the exams preview page and main section of the website.



Figure 26 Exams view

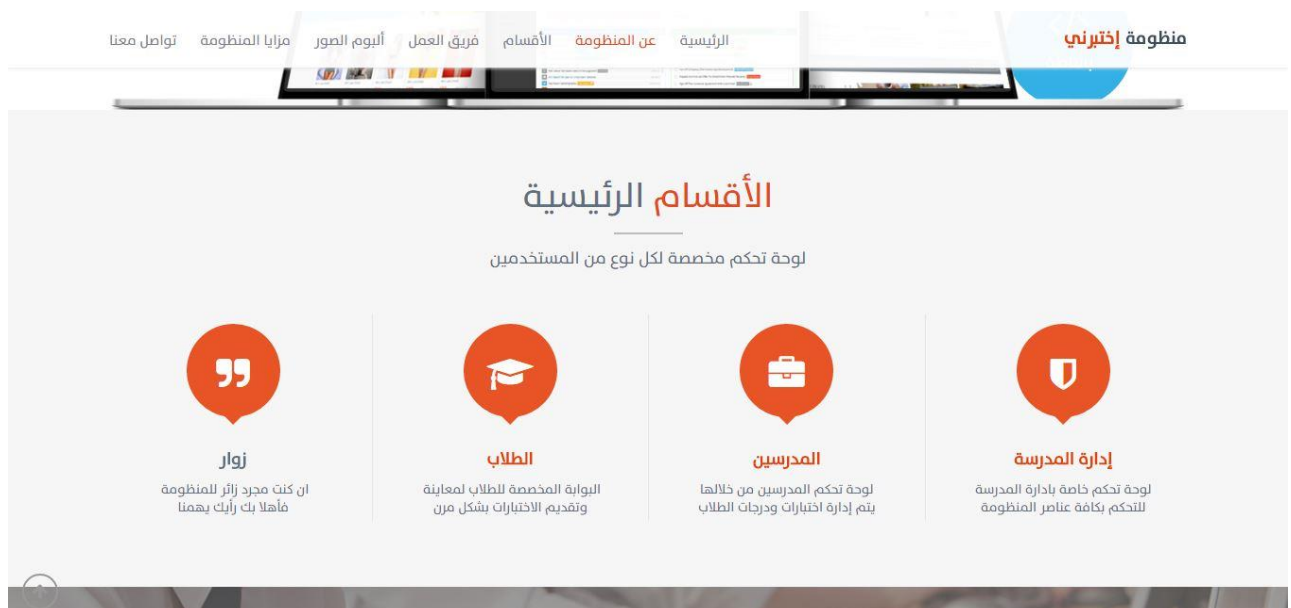


Figure 27 Section of the system

Figure C.3 and C.4 shows the page of management students and add new student.

منظومة إختبرني

الرئيسية التحكم بالمنظومة

التحكم بالمنظومة

الرئيسية التحكم بالمنظومة إدارة الطلاب

إضافة طالب جديد

بحث: سجلات 5

#	اسم المستخدم	كلمة المرور	اسم الطالب	البريد الإلكتروني	المرحلة	تعديل	حذف
1	ahmed	555	ahmed issam deeb	deebbigboss_87@hotmail.com	المرحلة السادسة	تعديل	حذف
2	sami	sami	wer	deebbigboss87@gmail.com	المرحلة الأولى	تعديل	حذف
3	120130525	Aa\$Qq	أحمد محمد أبو عاصي	ahmed-asi@gmail.com	المرحلة الثالثة	تعديل	حذف

عرض 1 الى 3 من 3 سجل

عناوين الاتصال: هاتف: 5682 123 500، بريد إلكتروني: info@ekhtabrni.com

تواصل معنا: v, y, in, g, t, f, r

القائمة البريدية: القائمة البريدية، mail@email.com

منظومة إختبرني: منظومة إلكترونية لأقل عملية الاختبارات المدرسية إلى مرحلة جديدة من التطور.

Figure 28 Managing students page

منظومة إختبرني

الرئيسية التحكم بالمنظومة

إضافة طالب

اسم المستخدم: 120130525

كلمة المرور:

تأكيد كلمة المرور:

المرحلة: المرحلة الثالثة

اسم الطالب: أحمد محمد أبو عاصي

الجنسية: فلسطيني

تاريخ الميلاد: 11/07/2007

البريد الإلكتروني: ahmed-asi@gmail.com

العنوان: غزة - الحلاء

رقم الهاتف: p82811445

حفظ

Figure 29 Add new student

Figure C.5 and C.6 shows managing exams page and add new question page.

أهلاً بك مين سمير

منظومة إختبرني

الرئيسية التحكم بالمنظومة

التحكم بالمنظومة

الرئيسية • التحكم بالمنظومة • إدارة الإختبارات

إدارة الإختبارات

إضافة إختبار جديد

المرحلة: المرحلة الثانية

المادة: اللغة العربية

بحث: 5 سجلات

#	اسم الإختبار	تاريخ الإختبار	وقت الإختبار	مدة الإختبار	حالة الإختبار	عدد الأسئلة	تعديل	حذف
1	الاختبار التمهيني	04/05/2016	12:00	10 دقيقة	فعال	0	تعديل	حذف

عرض 0 إلى 0 من 0 سجل

عناوين الاتصال: هاتف: 5682 123 500 بريد إلكتروني: info@ekhtabni.com

تواصل معنا

القائمة البريدية: mail@email.com

منظومة إختبرني: منظومة إلكترونية لنقل عملية الإختبارات المدرسية إلى مرحلة جديدة من التطور.

Figure 30 Managin exams page

أهلاً بك مين سمير

منظومة إختبرني

الرئيسية التحكم بالمنظومة

التحكم بالمنظومة

الرئيسية • التحكم بالمنظومة • إدارة الأسئلة

إدارة الأسئلة

إضافة سؤال جديد

المرحلة: المرحلة الأولى

المادة: اللغة العربية

الإختبار: إختبار شهر فبراير

بحث: 5 سجلات

#	السؤال	الإجابة الأولى	الإجابة الثانية	الإجابة الثالثة	الإجابة الرابعة	رقم الإجابة الصحيحة	حالة السؤال	تعديل	حذف
1	السلامةأكمل الفراغ	التي	الذي	تلك دقيقة	ليس مما سبق	4	فعال	تعديل	حذف

عرض 0 إلى 0 من 0 سجل

عناوين الاتصال: هاتف: 5682 123 500 بريد إلكتروني: info@ekhtabni.com

تواصل معنا

القائمة البريدية: mail@email.com

منظومة إختبرني: منظومة إلكترونية لنقل عملية الإختبارات المدرسية إلى مرحلة جديدة من التطور.

Figure 31 Add new question page

Figure C.7 and C.8 shows managing teachers and add new teacher page.

أهلاً بك مين سمير | منظومة إختبرني

الرئيسية التحكم بالمنظومة

التحكم بالمنظومة

الرئيسية • التحكم بالمنظومة • إدارة المدرسين

إدارة المدرسين

بحث: سجلات 5

#	اسم المستخدم	كلمة المرور	الاسم	البريد الإلكتروني	المرحلة	التخصص	تعديل	حذف
1	l1_arabic	123	محمد بن خميس سمير	l1_arabic@teacher.com	المرحلة الأولى	اللغة العربية	تعديل	حذف
2	l1_islamic	123	سبع ابو الضباع	l1_islamic@teacher.com	المرحلة الأولى	التربية الإسلامية	تعديل	حذف
3	saed	123	سائد عبد الوهاب	saed@wefwew.com	المرحلة الأولى	التربية المدنية	تعديل	حذف

عرض 1 إلى 3 من 3 سجل

عناوين الاتصال: هاتف: 5682 123 500 | بريد إلكتروني: info@ekhtabni.com | تواصل معنا | القائمة البريدية | منظومة إختبرني

Figure 32 Managing teachers page

أهلاً بك مين سمير | منظومة إختبرني

الرئيسية التحكم بالمنظومة

التحكم بالمنظومة

الرئيسية • التحكم بالمنظومة • إدارة المدرسين

إضافة مدرس

اسم المستخدم * moh_ahmed

كلمة المرور *

تأكيد كلمة المرور *

اسم المستخدم * أحمد رامي سلامة

البريد الإلكتروني * ahmad_r_s@hotmail.com

المرحلة * المرحلة الثانية

التخصص * التربية الإسلامية

حفظ

عناوين الاتصال: هاتف: 5682 123 500 | بريد إلكتروني: info@ekhtabni.com | تواصل معنا | القائمة البريدية | منظومة إختبرني

Figure 33 Add new teacher page

Figure C.9 and C.10 shows managing administrators and add new admin or secretary page.

إضافة مسؤول جديد

بحث:

سجلات 5

#	اسم المستخدم	كلمة المرور	الاسم	البريد الإلكتروني	تعديل	حذف
1	ali	3333	ali abo shakmha	aZzed.tech@gmail.com	تعديل	حذف
2	hadi_nabaris	aa	hadi hadi	hadi_1990@hotmail.com	تعديل	حذف
3	sami	111	sami sami	sam@sami.com	تعديل	حذف
4	gehad	0000	gehad gehad	aZzed.tech@gmail.com	تعديل	حذف
5	مهند	mohanad	mohanad	mohanad@sdf.sdd	تعديل	حذف
6	1	1	hazem	hazem-hzh@hotmail.com	تعديل	حذف

عرض 1 إلى 5 من 6 سجل

إدارة المسؤولين

الرئيسية • التحكم بالمنظومة • إدارة المسؤولين

عناوين الاتصال: هاتف: 5682 123 500 | بريد إلكتروني: info@ekhtabmi.com

تواصل معنا: [v](#) [t](#) [in](#) [g+](#) [f](#) [r](#)

القائمة البريدية: [اشترك](#) | mail@email.com

منظومة إختبرني: منظومة إلكترونية لنقل عملية الاختبارات المدرسية إلى مرحلة جديدة من التطور.

Figure 34 Managing administrations page

إضافة مسؤول

اسم المستخدم *

كلمة المرور *

تأكيد كلمة المرور *

اسم المستخدم *

البريد الإلكتروني *

حفظ

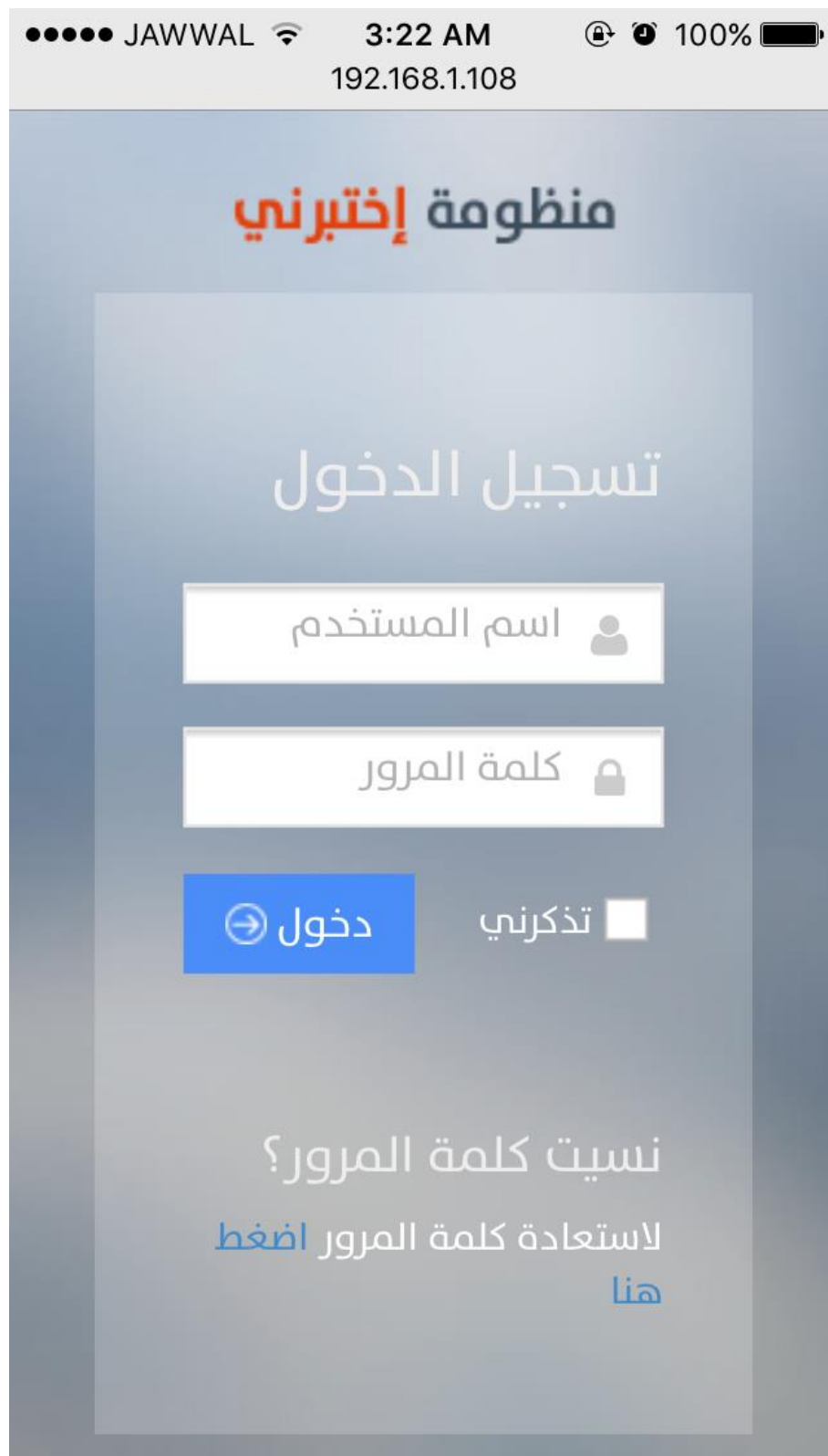
Figure 35 Add new admin page

Figure C.11 Shows the main sections in the mobile browser.



Figure 36 Main sections on mobile

Figure C.12 Shows the Login page in the mobile browser.



JAWWAL 3:22 AM 100% 192.168.1.108

منظومة إختبرني

تسجيل الدخول

اسم المستخدم

كلمة المرور

دخول تذكرني

نسيت كلمة المرور؟
لاستعادة كلمة المرور اضغط هنا

Figure 37 Login page on mobile

Figure C.11 shows add student page in the mobile browser.

192.168.1.108

✕ إضافة طالب +

* اسم المستخدم

* كلمة المرور

* تأكيد كلمة المرور

* المرحلة

Figure 38 Add student page on mobile

Appendix D: Activity Diagrams

Figure D.1 shows add student activity diagram.

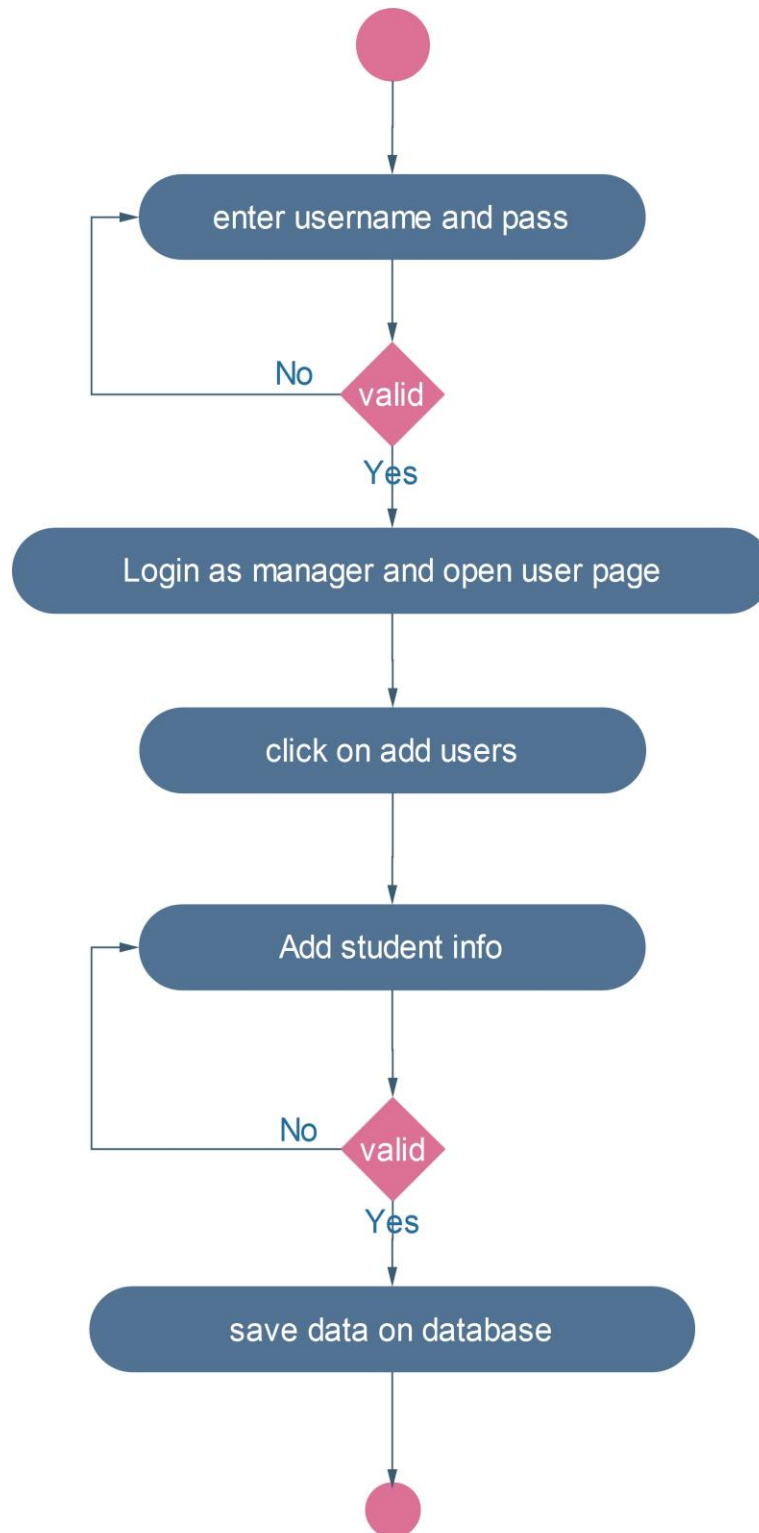


Figure 39 Add student activity diagram

Figure D.2 shows view details activity diagram.

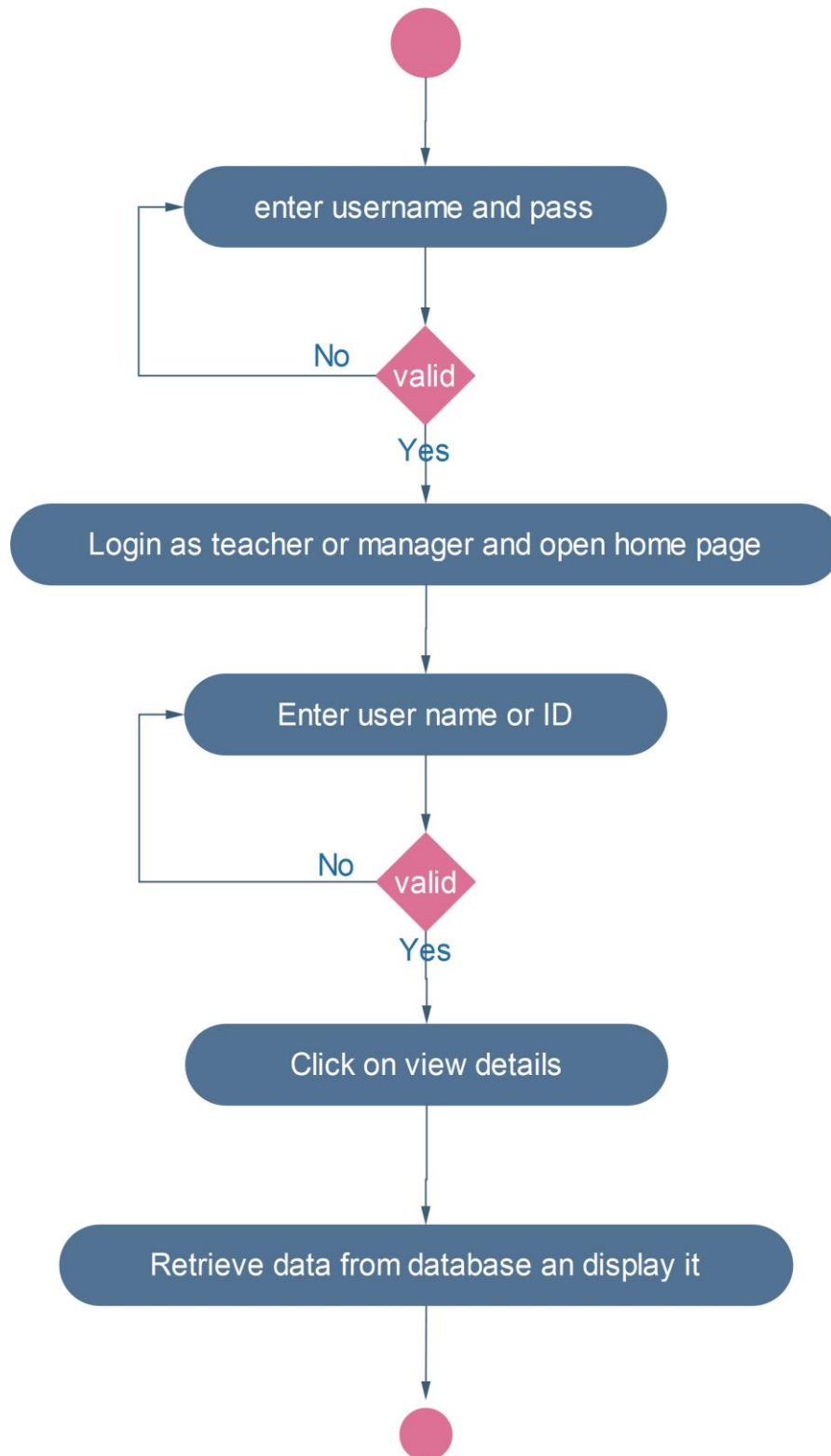


Figure 40 View student details activity diagram

Figure D.3 shows print certificate activity diagram.

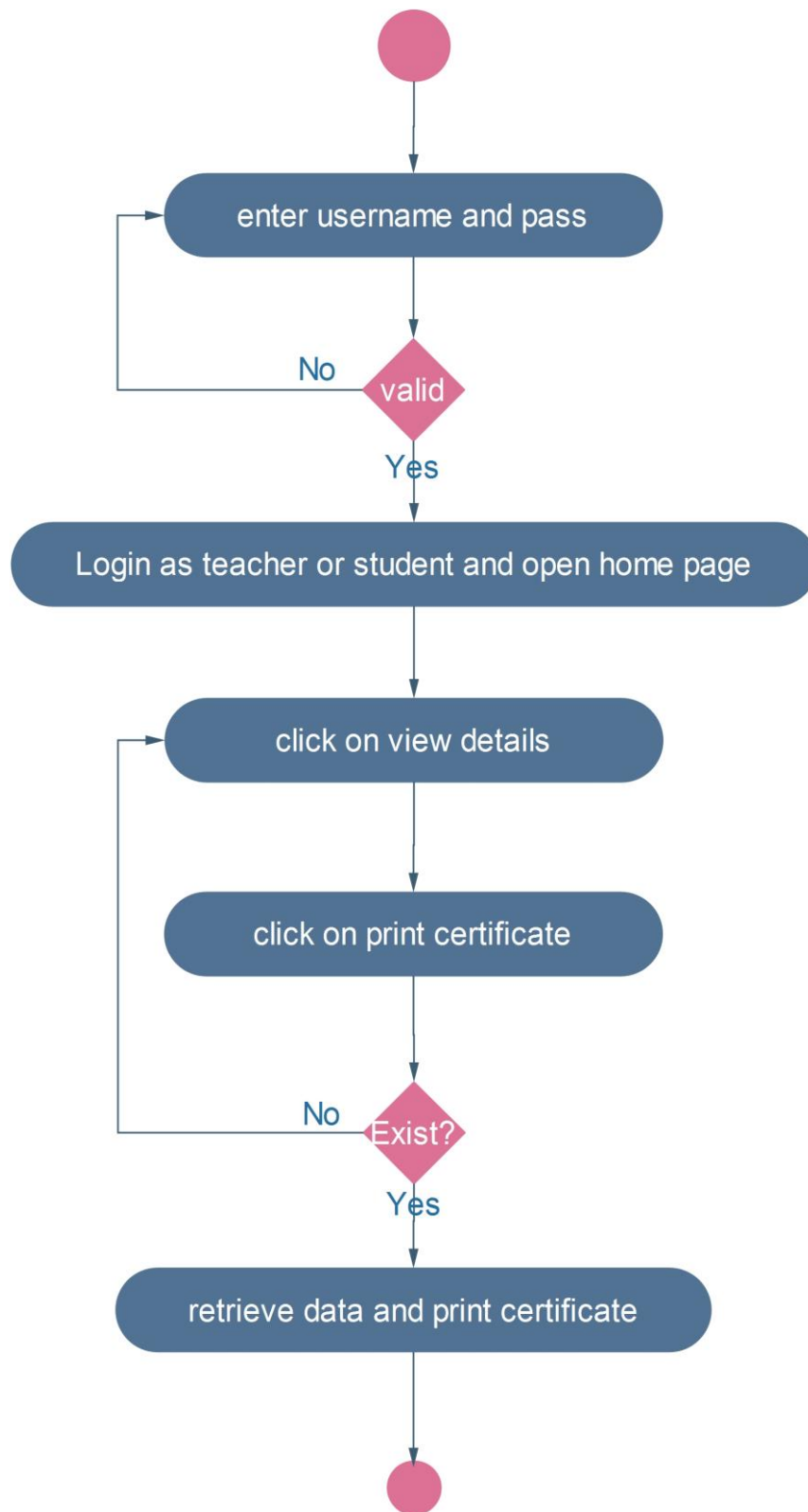


Figure 41 Print certificate activity diagram

